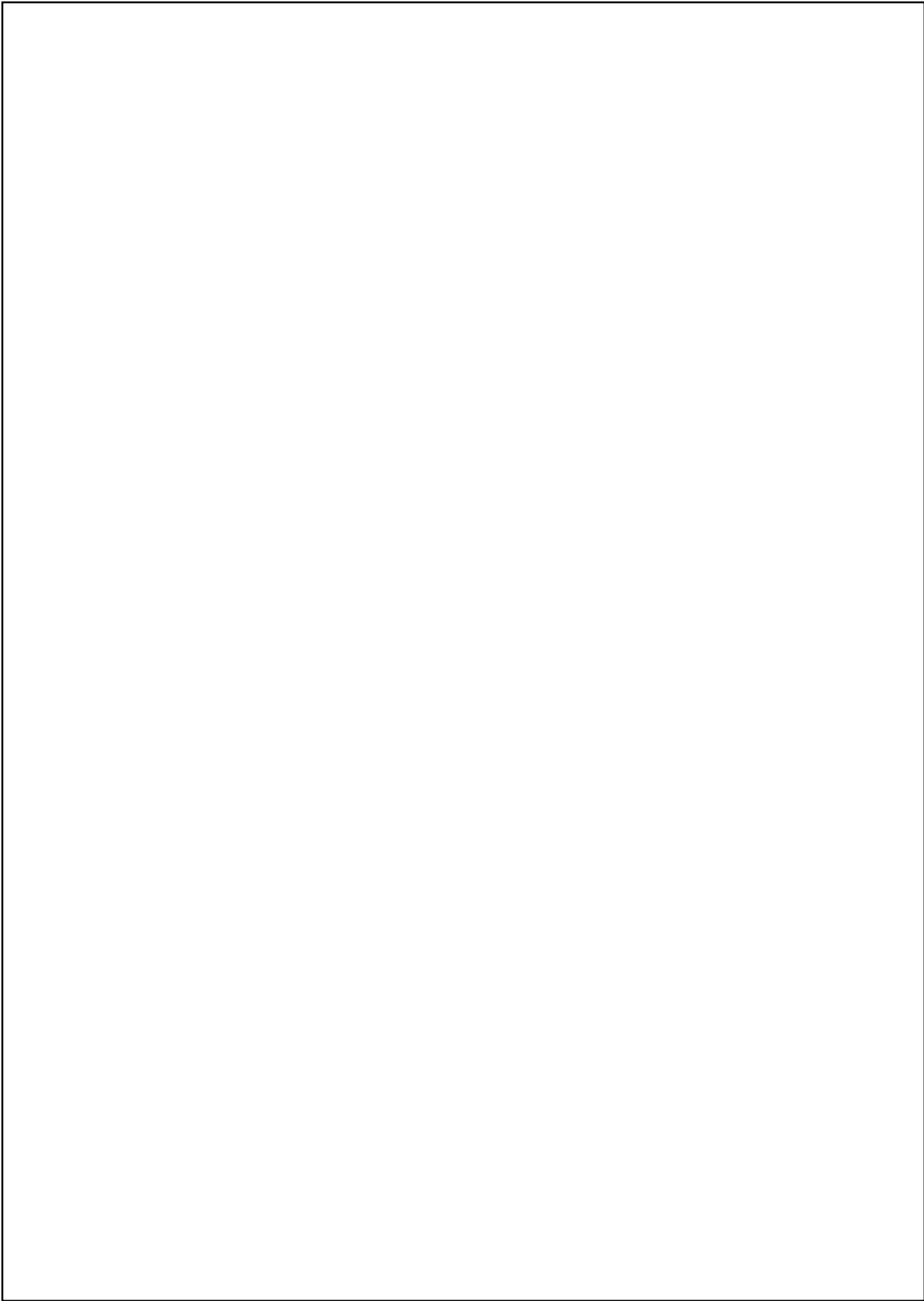


2005 SOUTH CAROLINA AQUATIC PLANT MANAGEMENT PLAN



**Prepared by the
South Carolina Department of Natural Resources
and Approved by the
South Carolina Aquatic Plant Management Council**

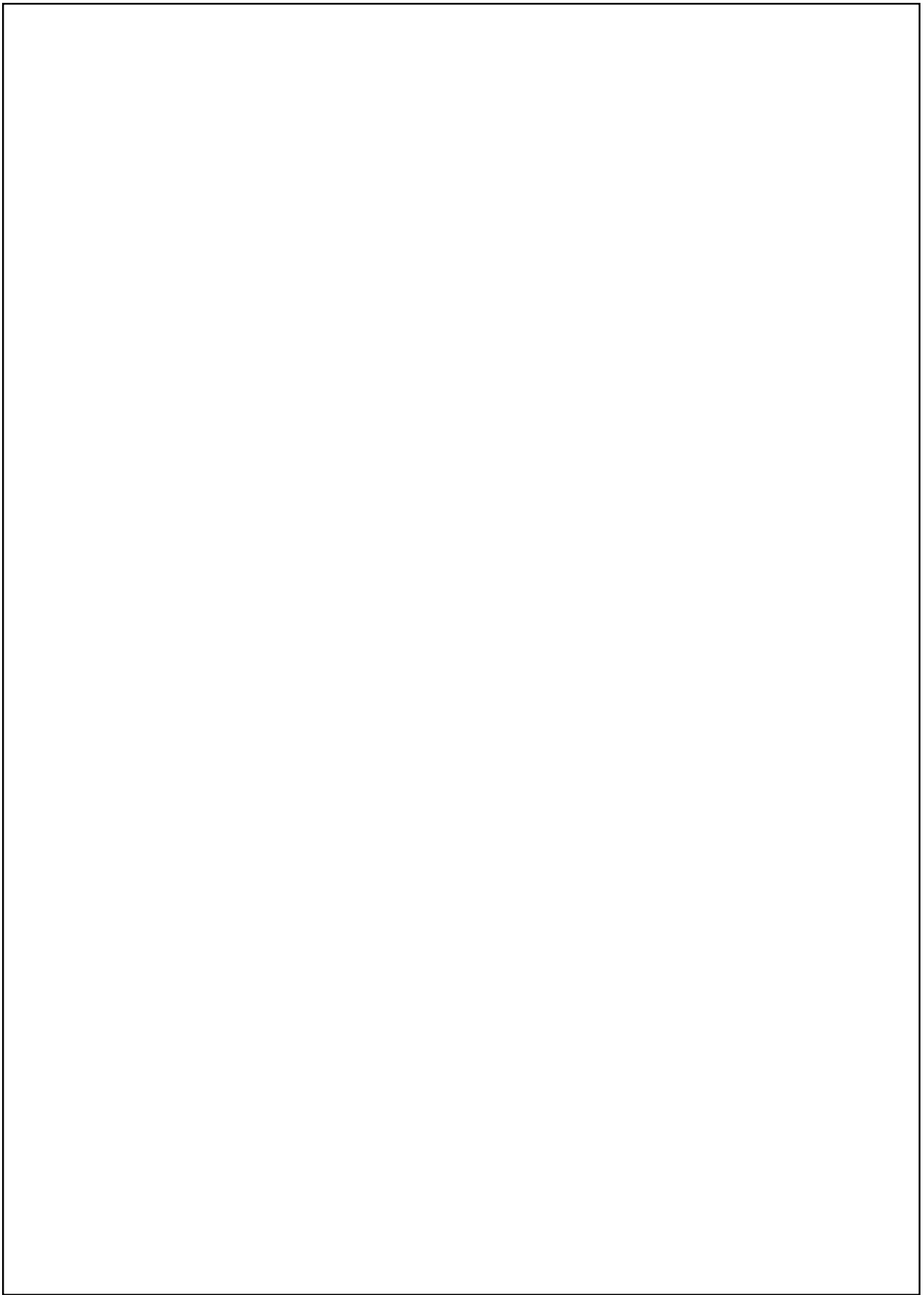
March, 2005



2005
SOUTH CAROLINA
AQUATIC PLANT MANAGEMENT
PLAN

Prepared by the
South Carolina Department of Natural Resources
and Approved by the
South Carolina Aquatic Plant Management Council

March, 2005



SOUTH CAROLINA AQUATIC PLANT MANAGEMENT COUNCIL

Steven J. de Kozlowski (Council Chairman) - S.C. Department of Natural Resources,
Land, Water, and Conservation Division

Jeannie Eidson - S.C. Department of Health and Environmental Control, Environmental Quality
Control, Bureau of Water

Miller White - S.C. Department of Natural Resources, Wildlife and Freshwater Fisheries Division

Marc L. Cribb - S.C. Department of Natural Resources, Land, Water, and Conservation Division

David L. Tompkins - S.C. Department of Agriculture

John Hensel - S.C. Department of Health and Environmental Control, Environmental Quality
Control, Office of Coastal Resource Management

John Inabinet - S.C. Public Service Authority (Santee Cooper)

Stan Hutto - S.C. Department of Parks, Recreation, and Tourism

Cam C. Lay - Clemson University, Department of Pesticide Regulation

Appointment Pending- Governor's Office

Office of the Chairman

Steven J. de Kozlowski
South Carolina Department of Natural Resources
P.O. Box 167
Columbia, South Carolina 29202
(803) 734-9114
dekozlowkis@dnr.sc.gov

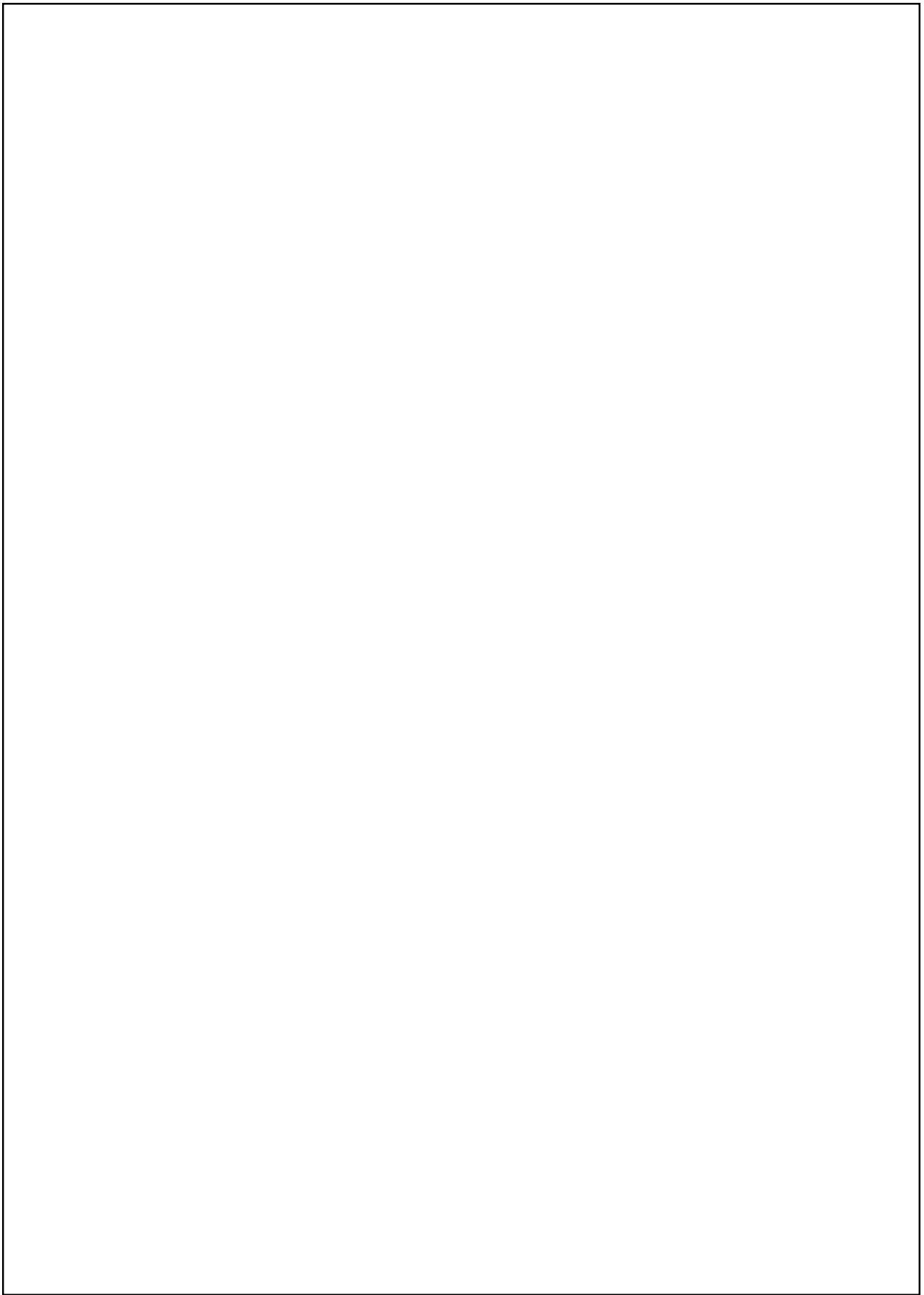


TABLE OF CONTENTS

PART I - PROCEDURAL MANAGEMENT PLAN	1
INTRODUCTION	3
Surface Water Resources	3
Importance of Aquatic Plants	3
History of Aquatic Plant Problems and Management	3
Aquatic Plant Management Program and Council	4
The Federal Aquatic Plant Control Cost-Sharing Program	5
PURPOSE AND OBJECTIVES	6
Purpose and Function of the Management Plan	6
Objectives of the Management Program	6
PROBLEM IDENTIFICATION AND ANALYSIS	7
Identification of Aquatic Plant Problem Areas	7
Analysis of Aquatic Plant Problem Areas	7
SELECTION OF CONTROL METHODS	8
Determination of Desired Level of Control	8
Identification of Potential Control Techniques	8
Determination of Environmental and Water Use Constraints	8
Ranking of Control Techniques	8
Selection of Best Control Method	8
OPERATIONAL PROGRAM DEVELOPMENT	9
Application of the Control Method	9
Determination of Cost of the Operational Program	9
Priority Ranking of Problem Areas	10
Review of the Annual Management Plan	10
Request for Funding	10
IMPLEMENTATION OF THE ANNUAL MANAGEMENT PLAN	11
Implementation of the Operational Strategy	11
Limitations on Implementation	11
Monitoring the Effects of the Program	12
APPROVAL OF THE AQUATIC PLANT MANAGEMENT PLAN	12
PART II - 2005 ANNUAL MANAGEMENT PLAN	13
INTRODUCTION	15
AQUATIC PLANT PROBLEM AREAS	17

PLANT MANAGEMENT STRATEGY	23
1. Ashepoo River	23
2. Back River Reservoir	26
3. Black Mingo Creek	31
4. Black River	34
5. Bonneau Ferry	37
6. Combahee River	40
7. Cooper River	43
8. Donnelley/Bear Island WMA	46
9. Goose Creek Reservoir	49
10. Lake Greenwood	52
11. Lake Keowee	55
12. Lake Marion	58
13. Lake Moultrie	64
14. Lake Murray	69
15. Lake Wateree	74
16. Little Pee Dee River	77
17. Lumber River	80
18. Pee Dee River	83
19. Santee Coastal Reserve	86
20. Santee Delta WMA	89
21. Waccamaw River	93
22. Yawkey Wildlife Center	95
23. Barnwell State Park	98
24. Charles Towne Landing State Park	101
25. Kings Mountain State Park - Crawford Lake	104
26. Little Pee Dee State Park	107
27. Santee State Park - Swimming lake	110
28. Sesquicentennial State Park	113

SUMMARY OF PLANNED MANAGEMENT EXPENDITURES FOR 2005	116
---	-----

LOCATION OF PLANNED MANAGEMENT SITES FOR 2005	117
---	-----

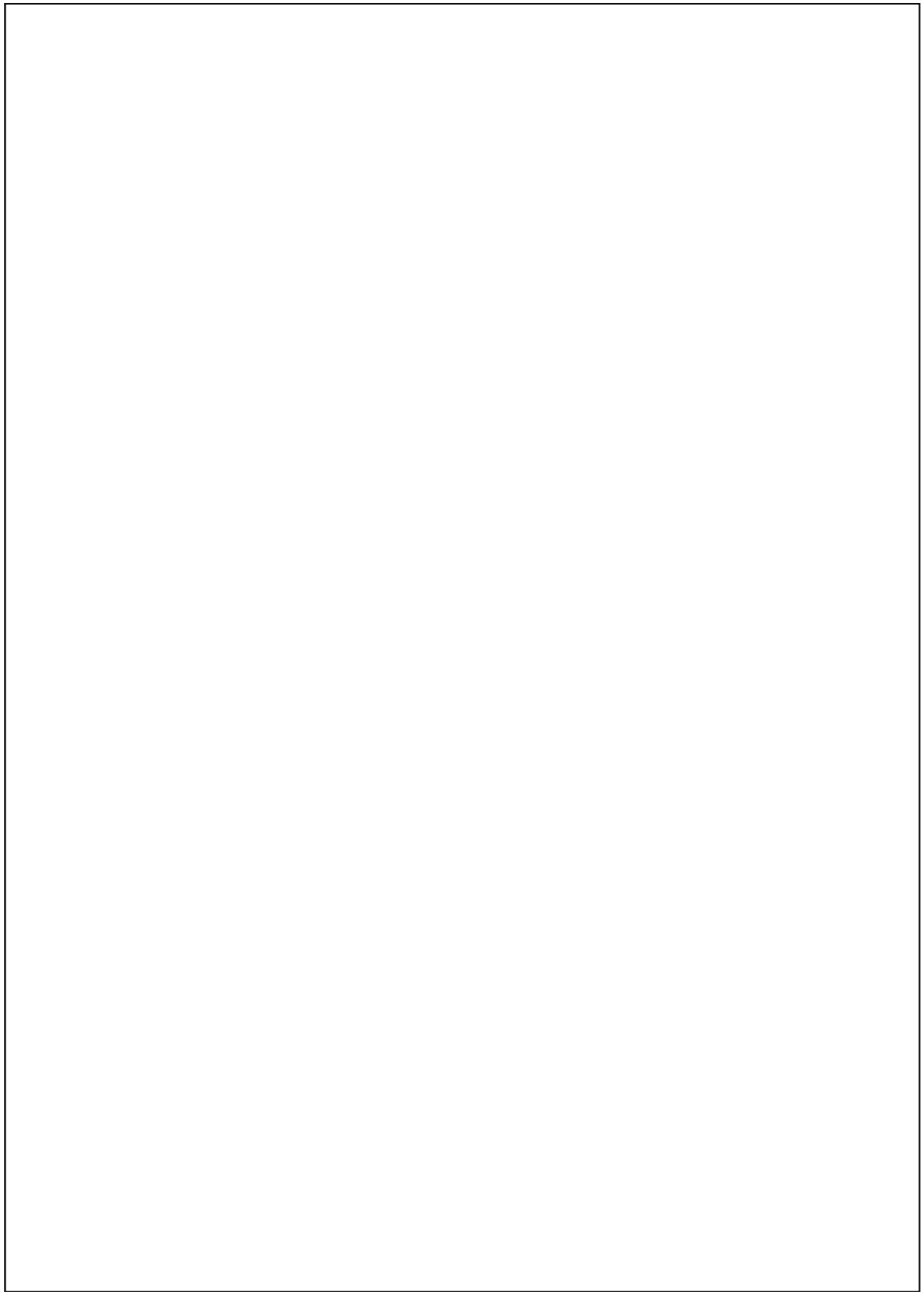
APPENDICES	118
------------	-----

APPENDIX A - Major River Basins and Sub-basins in South Carolina	
APPENDIX B - Act 498	
APPENDIX C - Aquatic Plant Problem Identification Form	
APPENDIX D - Aquatic Plant Control Agents	
APPENDIX E - SCDNR and Santee Cooper Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes	
APPENDIX F - Summary of Aquatic Plant Control Expenditures	
APPENDIX G - Summary of Public Comments, Responses, and Plan Modifications to the Draft 2005 South Carolina Aquatic Plant Management Plan	

2005

ANNUAL MANAGEMENT PLAN

PART II

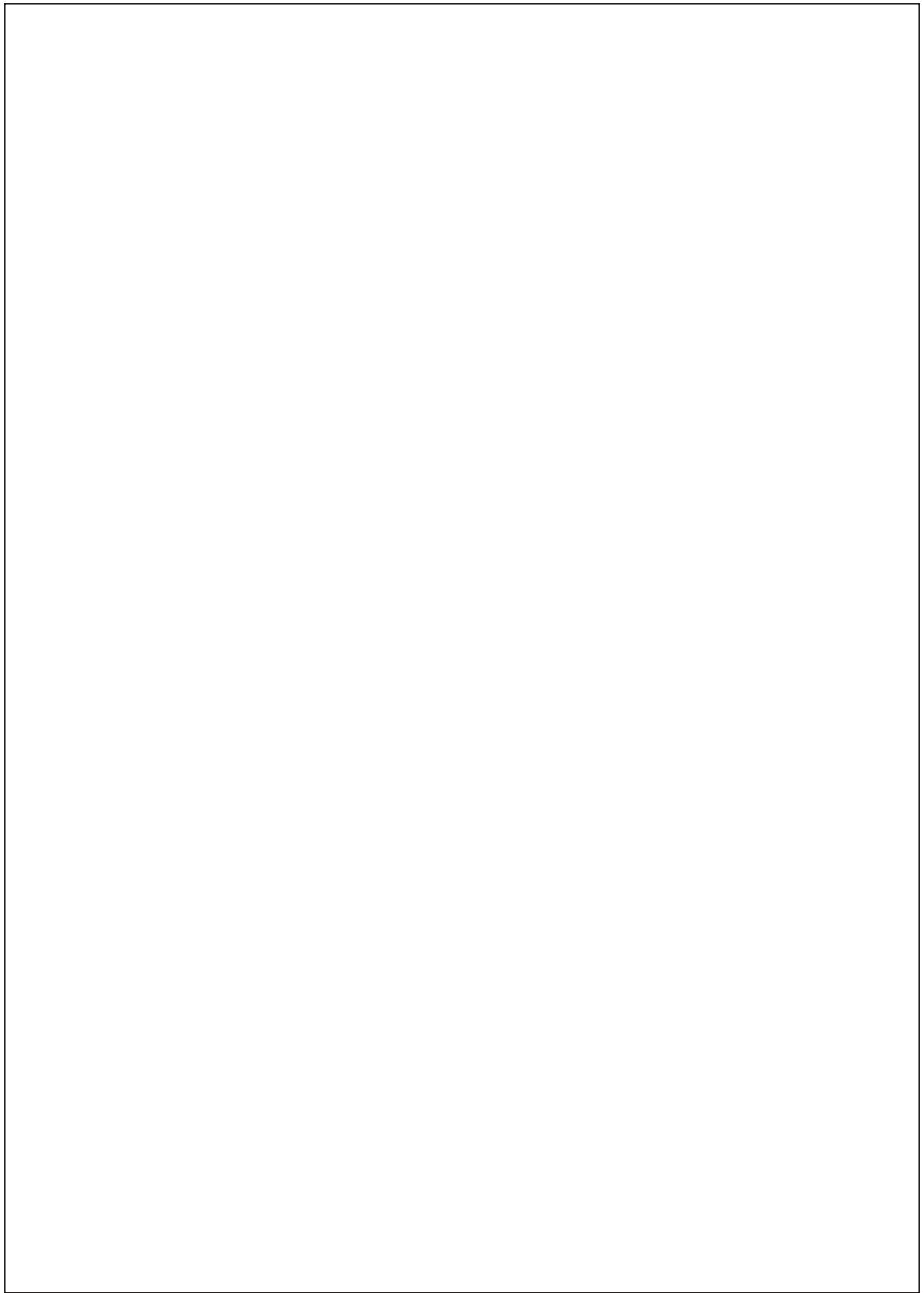


INTRODUCTION

The Annual Management Plan for 2005 was developed by application of the procedures described in the Aquatic Plant Management Plan, Part I (Procedural Management Plan). The phases of development of the Annual Management Plan include 1) identification of areas where aquatic plants interfere with water use, 2) development of a description of each problem area, 3) development of a management strategy for each problem area, and 4) determination of the distribution of available funding among problem areas.

Common and Scientific Names of Aquatic Plants Referenced in the Plan

Alligatorweed	<i>Alternanthera philoxeroides</i>
Bladderwort	<i>Utricularia</i> spp.
Brazilian elodea	<i>Egeria densa</i>
Cowlily	<i>Nuphar luteum macrophyllum</i>
Cattails	<i>Typha</i> spp.
Coontail	<i>Ceratophyllum demersum</i>
Creeping rush	<i>Juncus repens</i>
Curly-leaf pondweed	<i>Potamogeton crispus</i>
Duckweed	<i>Lemna</i> spp.
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Fanwort	<i>Cabomba caroliniana</i>
Filamentous algae	<i>Pithophora</i>
Lyngby, Hydrodictyon	
Floating bladderwort	<i>Utricularia inflata</i>
Floating heart	<i>Nymphoides</i> spp.
Giant cutgrass	<i>Zizaniopsis miliacea</i>
Hydrilla	<i>Hydrilla verticillata</i>
Musk-grass	<i>Chara</i>
Pondweed	<i>Potamogeton</i> spp.
Common reed	<i>Phragmites australis</i>
Slender naiad	<i>Najas minor</i>
Smartweed	<i>Polygonum densiflorum</i>
Southern naiad	<i>Najas guadalupensis</i>
Spikerush	<i>Eleocharis</i> spp.
Stonewort	<i>Nitella</i>
Variable-leaf pondweed	<i>Potamogeton diversifolius</i>
Waterlily	<i>Nymphaea odorata</i>
Water hyacinth	<i>Eichhornia crassipes</i>
Water lettuce	<i>Pistia stratiotes</i>
Watermilfoil	<i>Myriophyllum</i> spp.
Water pennywort	<i>Hydrocotyle ranunculoides</i>
Water primrose	<i>Ludwigia hexapetala</i>
Watershield	<i>Brasenia schreberi</i>



AQUATIC PLANT PROBLEM AREAS

Areas where aquatic plants interfere with water use were identified from information provided by S.C. Aquatic Plant Management Council members, an aquatic plant survey conducted by the S.C. Department of Natural Resources staff and public input. The identified problem areas listed below are open to access and use by the public and are therefore considered by the Council as eligible for some type of public funding. Acres of infestation (coverage) are approximations based on observations made in 2004.

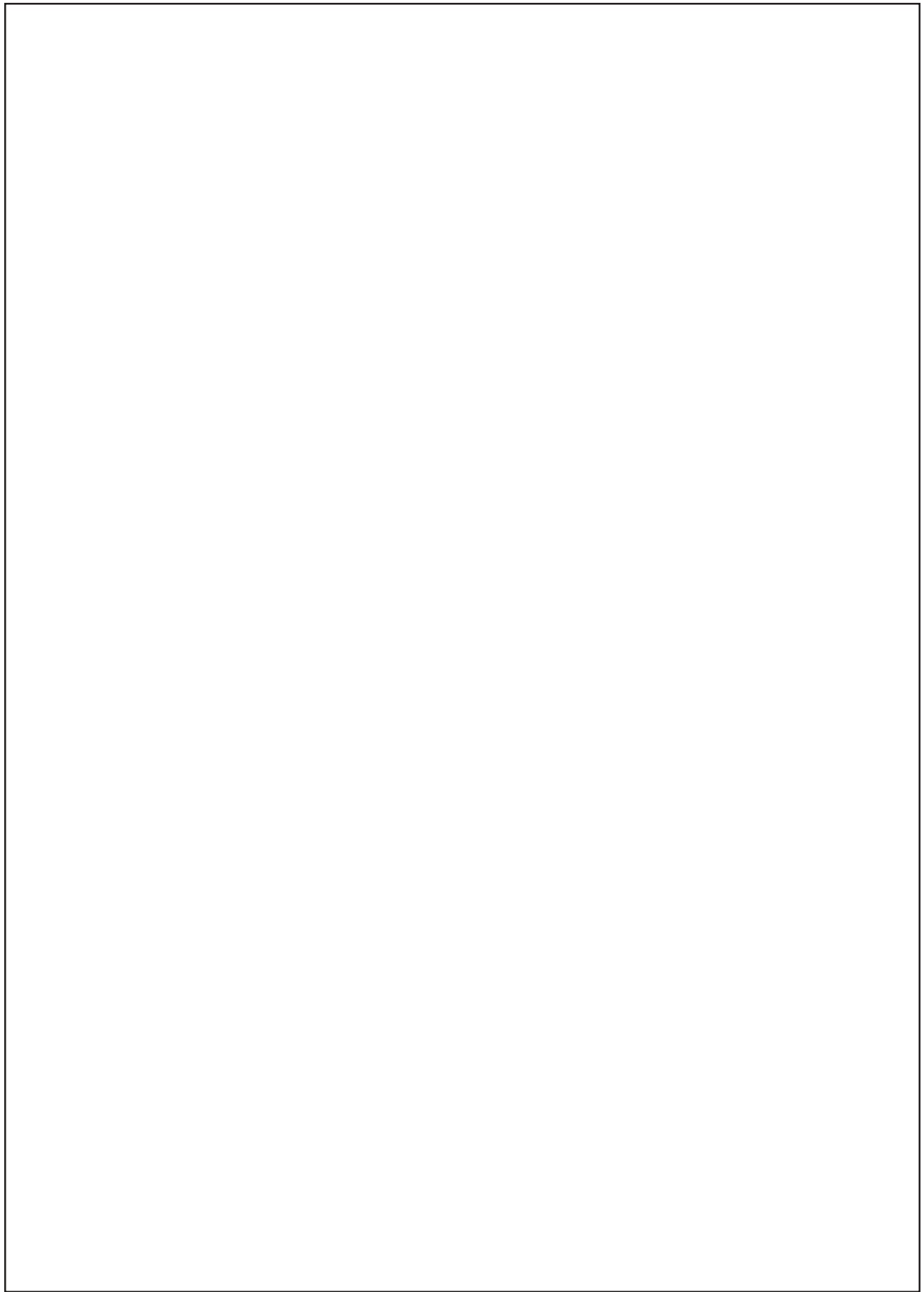
1. Water body - ***Ashepoo River***
Location - Colleton County
Surface acres - unknown
Aquatic plants - Water hyacinth
Coverage -5 acres
Impaired activities - Boating, fishing, public access
2. Water body - ***Back River Reservoir***
Location - Berkeley County
Surface acres - 850
Aquatic plants - Brazilian elodea, hydrilla, water hyacinth, water primrose, fanwort
Coverage - 380 acres
Impaired activities- Boating, fishing, hunting, swimming, industrial water supply,
municipal water supply, electric power generation, public access
3. Water body - ***Black Mingo Creek***
Location - Georgetown County
Surface acres -Unknown
Aquatic plants - Alligatorweed, parrot feather
Coverage - 30 acres
Impaired activities - Boating, hunting, fishing, public access
4. Water body - ***Black River***
Location - Georgetown County
Surface acres -Unknown
Aquatic plants - Alligatorweed
Coverage - 50 acres
Impaired activities - Boating, hunting, fishing, public access
5. Water body - ***Bonneau Ferry***
Location - Berkeley County
Surface acres -Unknown - Multiple Reserves and impoundments
Aquatic plants - Water hyacinth, water primrose, frog's bit, lotus, cat-tails, cutgrass,
pennywort, parrotfeather
Coverage - 50+ acres
Impaired activities - Boating, hunting, fishing, public access

6. Water body - ***Combahee River (Borrow pit)***
Location - Colleton County
Surface acres - approx. 5 acres
Aquatic plants - Hydrilla, water primrose, water hyacinth
Coverage - 4 acres
Impaired activities - Boating, hunting, fishing, public access
7. Water body - ***Cooper River*** (and adjacent ricefields)
Location - Berkeley County
Surface acres - Unknown
Aquatic plants - Hydrilla, water primrose, water hyacinth
Coverage - approx. 2,000 acres
Impaired activities - Boating, hunting, fishing, public access
8. Water body - ***Donnelley/Bear Island WMA***
Location - Colleton County
Surface acres - Unknown
Aquatic plants - Cutgrass, Phragmites
Coverage - 50+ acres
Impaired activities - Hunting, public access
9. Water body - ***Goose Creek Reservoir***
Location - Berkeley County
Surface acres - 500
Aquatic plants - Water hyacinth, water lettuce, water primrose
Coverage - 80 acres
Impaired activities - Boating, public access, industrial water supply, floodway
10. Water body - ***Lake Greenwood***
Location - Laurens and Greenwood Counties
Surface acres - 11,400
Aquatic plants - Hydrilla, slender naiad
Coverage - 225 acres
Impaired activities - Boating, swimming, vector control, public access
11. Water body - ***Lake Keowee***
Location - Pickens and Oconee Counties
Surface acres - 18,300
Aquatic plants - Hydrilla
Coverage - 10 acres
Impaired activities - Potential impacts to water recreation, public access, electric power generation, municipal water supply

12. Water body - ***Lake Marion***
Location - Sumter, Clarendon, Calhoun, Berkeley, and Orangeburg Counties.
Surface acres - 110,000
Aquatic plants - Alligatorweed, Brazilian elodea, hydrilla, water primrose, slender naiad, coontail, water hyacinth, filamentous algae, fanwort, giant cutgrass
Coverage - 1000 acres
Impaired activities - Boating, swimming, public access, potential electric power generation, potential irrigation water withdrawals
13. Water body - ***Lake Moultrie***
Location - Berkeley County
Surface acres - 60,400
Aquatic plants - Alligatorweed, water primrose, Brazilian elodea, hydrilla, slender naiad, water hyacinth, watermilfoil, fanwort, giant cutgrass
Coverage - 150 acres
Impaired activities - Potential electric power generation, boating, swimming, public access, potential domestic and irrigation water withdrawals
14. Water body - ***Lake Murray***
Location - Lexington and Richland Counties
Surface acres - 50,000
Aquatic plants - Hydrilla, Illinois pondweed
Coverage - 3800 acres
Impaired activities - Boating, swimming, potential domestic and municipal water intakes, public access
15. Water body - ***Lake Wateree***
Location - Kershaw County
Surface acres - 13,710
Aquatic plants - Hydrilla
Coverage - < 2 acres
Impaired activities - Potential boating, swimming, public access
16. Water body - ***Little Pee Dee River***
Location - Marion and Horry Counties
Surface acres -Unknown
Aquatic plants - Alligatorweed
Coverage - 100 acres
Impaired activities - Boating, hunting, fishing, public access
17. Water body - ***Lumber River***
Location - Marion and Horry Counties
Surface acres -Unknown
Aquatic plants - Alligatorweed
Coverage - 40 acres
Impaired activities - Boating, hunting, fishing, public access

18. Water body - ***Pee Dee River***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Water hyacinth
Coverage - 50 acres
Impaired activities - Boating, hunting
19. Water body - ***Santee Coastal Reserve***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 600+ acres
Impaired activities - Hunting, public access
20. Water body - ***Santee Delta WMA***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 50+ acres
Impaired activities - Hunting, public access
21. Water body - ***Waccamaw River***
Location - Georgetown and Horry Counties
Surface acres - Unknown
Aquatic plants - Water hyacinth
Coverage - 125 acres
Impaired activities - Boating, hunting, fishing, public access
22. Water body - ***Yawkey Wildlife Center***
Location - Georgetown County
Surface acres - Unknown
Aquatic plants - Phragmites
Coverage - 50+ acres
Impaired activities - Hunting, public access
23. Water body - ***Barnwell State Park***
Location - Barnwell County
Surface acres - 12
Aquatic plants - Waterlily
Coverage - 3 acres
Impaired activities - Fishing, swimming, aesthetics

24. Water body - ***Charles Towne Landing State Park***
Location - Charleston County
Surface acres - 5
Aquatic plants - Duckweed, alligatorweed, pennywort, cyanobacteria
Coverage - 4 acres
Impaired activities - Fishing, aesthetics
25. Water body - ***Kings Mountain State Park - Crawford Lake***
Location - York County
Surface acres - 9
Aquatic plants - Slender naiad
Coverage - 4 acres
Impaired activities - Swimming, boating
26. Water body - ***Little Pee Dee State Park***
Location - Dillon County
Surface acres - 75
Aquatic plants - Spikerush, cowlily
Coverage - 15 acres
Impaired activities - Fishing, boating
27. Water body - ***Santee State Park - Swimming lake***
Location - Orangeburg County
Surface acres - Unknown
Aquatic plants - Coontail
Coverage - 10 acres
Impaired activities - Swimming, recreational activities
28. Water body - ***Sesquicentennial State Park***
Location - Richland County
Surface acres - 25 acres
Aquatic plants - Waterlily, watershield
Coverage - 10
Impaired activities - Swimming, fishing



AQUATIC PLANT MANAGEMENT STRATEGY

The following management strategies were developed for each identified problem area considered eligible for public funding. Planned expenditures are based on known available federal funds, estimated state funds and anticipated local support as of the date of this plan. For water bodies in which final funding is inadequate to conduct all proposed control operations, the extent of control will be reduced and priority areas and target plants will be determined by the Department of Natural Resources in cooperation with the local sponsor. A summary of proposed expenditures for 2005 and a location map of problem water bodies are located at the end of this section.

1. Ashepoo River

(Colleton County)

1. Problem plant species
Water hyacinth
2. Management objective
Reduce water hyacinth populations to the greatest extent possible, throughout the river system.
3. Selected control method
Reward
4. Area to which control is to be applied
5 acres of water hyacinth throughout river
5. Rate of control agents to be applied
0.5 gallon per acre.
6. Method of application of control agents
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Reward to be applied periodically to water hyacinth from May through October, as needed.
8. Other control application specifications
All affected water users will be notified of proposed chemical control activities prior to application.
9. Entity to apply control agents
Commercial applicator

10. Estimated cost of control operations

\$437

11. Potential sources of funding

Colleton County 30%

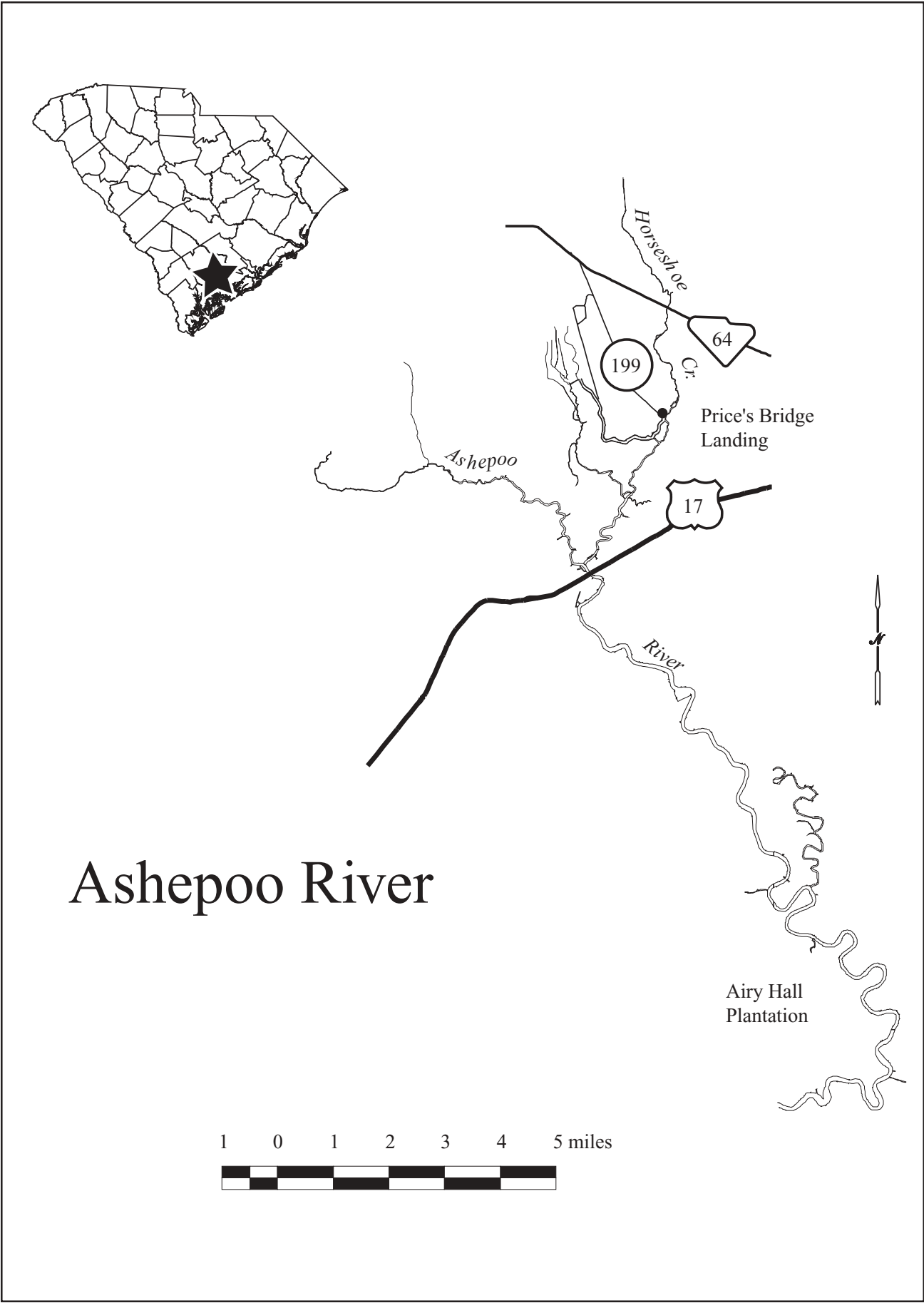
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



2. Back River Reservoir

(Berkeley County)

1. Problem plant species

Hydrilla	Water hyacinth
Brazilian elodea	Fanwort
Water primrose	Cutgrass

2. Management objectives

- a. Reduce water hyacinth and water primrose populations throughout the lake to enhance public access, navigation, water flow and minimize impacts to water intakes from floating islands.
- b. Reduce hydrilla in upper Foster Creek area to improve water quality, waterflow and navigation.
- c. Reduce hydrilla and fanwort in 60 acre area adjacent to SCE&G Williams Station intake to enhance water flow, minimize clogging of water intake, and enhance public boating and fishing use in this area.
- d. Reduce hydrilla and fanwort at Bushy Park Landing to enhance public boating and fishing use in this area.

3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Water hyacinth	Renovate 3, Reward
Water primrose, Cutgrass	Renovate 3, Reward, Habitat/Glyphosate
Hydrilla, Brazilian elodea	Chelated copper*, Sonar
Fanwort	Endotholl

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Renovate 3, Reward - 300 acres of water hyacinth throughout the lake.

Habitat,/Glyphosate - 150 acres of water primrose and cutgrass throughout the lake.

Chelated copper - 185 acres of hydrilla (3 treatments of 60 acre area near SCE&G intake, 5 acres of hydrilla adjacent to Bushy Park Landing).

Sonar - 60 acres of hydrilla in Foster Creek arm (3 treatments - 20 acres each).

Endotholl - 5 acres of fanwort adjacent to Bushy Park Landing.

5. Rate of control agents to be applied

Renovate 3 - 0.5 - 0.75 gallons per acre

Reward - 0.5 gallon per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.

Sonar - 0.25 gallons per acre

Endotholl - up to 7 gallons per acre.

6. Method of application of control agents

Renovate 3, Reward, Habitat/Glyphosate - spray on surface of foliage with appropriate surfactant.

Chelated copper, Endotholl - subsurface injection from airboat.

7. Timing and sequence of control application

Three hundred (300) acres of water hyacinths treated with Renovate 3(May-July), Reward(July-October). The initial treatments are to be followed in 1-2 days with a cleanup treatment.

One Hundred fifty (150) acres of water primrose and cutgrass treated with Habitat/Glyphosate during the growing season(May-October).

20 acres of hydrilla in Foster Creek to be treated 3 times (April-October) with Sonar.

Hydrilla and fanwort located adjacent to public boat ramp to be treated with chelated copper, endotholl.

Hydrilla located near the SCE&G water intake to be treated periodically during the year with chelated copper (up to three times in the same 60 acre area), treatment area may be expanded as control is realized in target area.

8. Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Renovate 3 treatments conducted within 1600 feet of the CPW water intake will use a rate of 0.5 gallons per acre or less. Reward treatments will be conducted at least 1600 feet from the intake. Following any application of Reward within 1600 feet of the CPW water intake, herbicide residue concentrations may be monitored according to a plan agreed to by the S.C. Department of Natural Resources, Charleston Commissioners of Public Works(CPW), and the Depart-

ment of Health and Environmental Control.

If filamentous algae is present on submersed macrophytes, an algicide, such as K-TEA, will be used in addition to selected herbicides to assist in control.

Control is to be applied in a manner that will not significantly degrade water quality in the treatment area. This may involve treating only a portion of the area at any one time.

9. Entity to apply control agents

Commercial applicator

10. Estimated cost of control operations

\$121,965

11. Potential sources of funding

Water primrose and water hyacinths -

Charleston Commissioners of Public Works 18%

S.C. Electric and Gas Co. 12%

U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla and Cabomba (near SCE&G intake) -

South Carolina Electric and Gas Co. 30%

U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

Hydrilla (Foster Creek, boat ramp, and Back River) -

Charleston Commissioners of Public Works 15%

U.S. Naval Weapons Station 15% (Foster Creek, *NoCOE match money)

U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

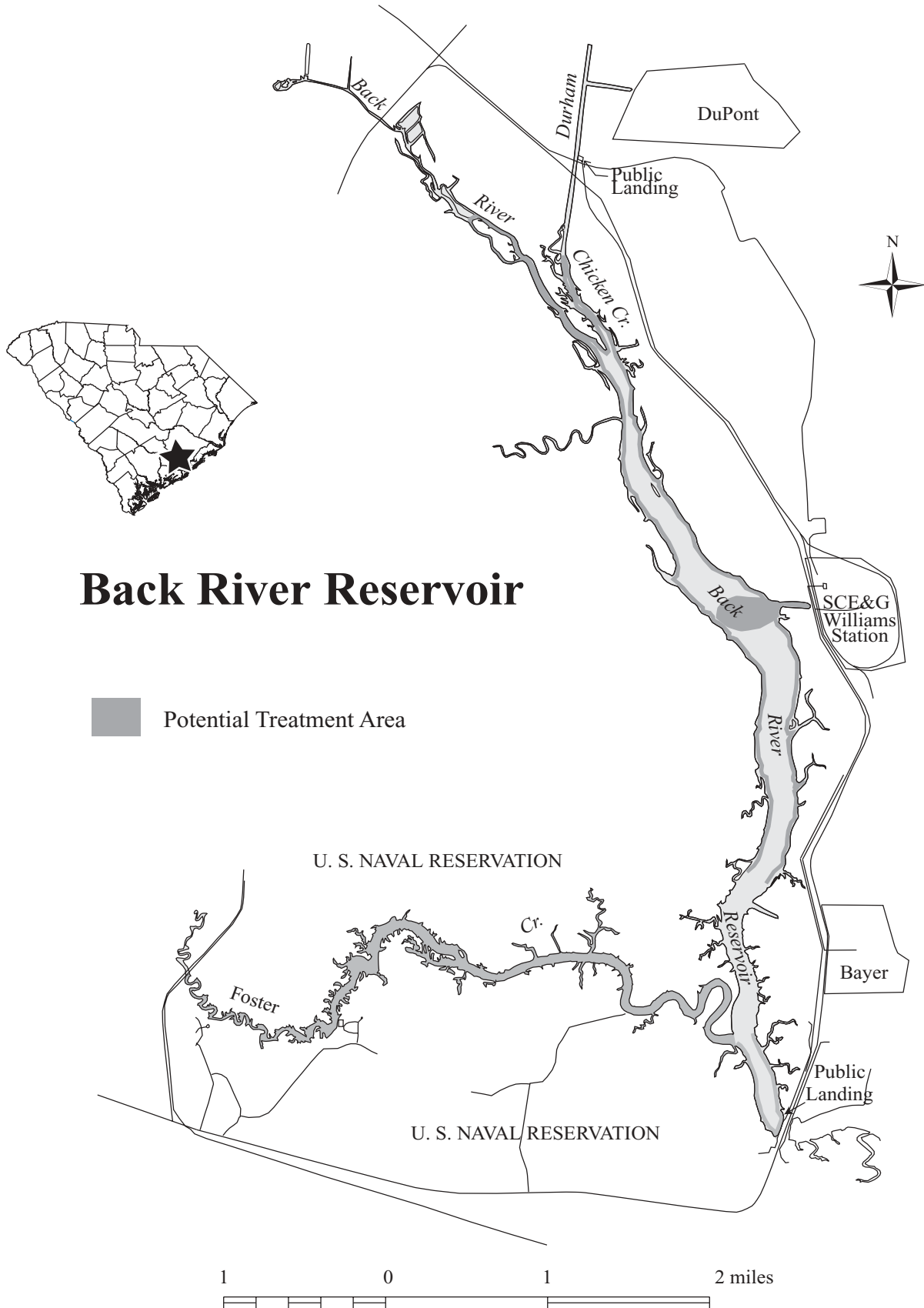
(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control

methods.

- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Effective long term control of water hyacinth in the reservoir must also include control of this species in the Cooper River to which the reservoir is connected.



3. Black Mingo Creek

(Georgetown County)

1. Problem plant species

Alligatorweed
Frog's bit

Parrot feather
Pennywort

2. Management objective

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

3. Selected control method

Problem Species

Alligatorweed, Pennywort
Frog's bit, Parrot feather

Control Agent

Renovate 3, Habitat /Glyphosate
Reward

4. Area to which control is to be applied

30 acres of problematic plants throughout river

5. Rate of control agent to be applied

Reward - 0.5 gallon per acre.

Renovate 3 - 0.5-0.75 gallons per acre.

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.

6. Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

7. Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

9. Entity to apply control agent

Commercial applicator

10. Estimated cost of control operations

\$3,790

11. Potential sources of funding

Georgetown County 30%

U.S. Army Corps of Engineers 40%

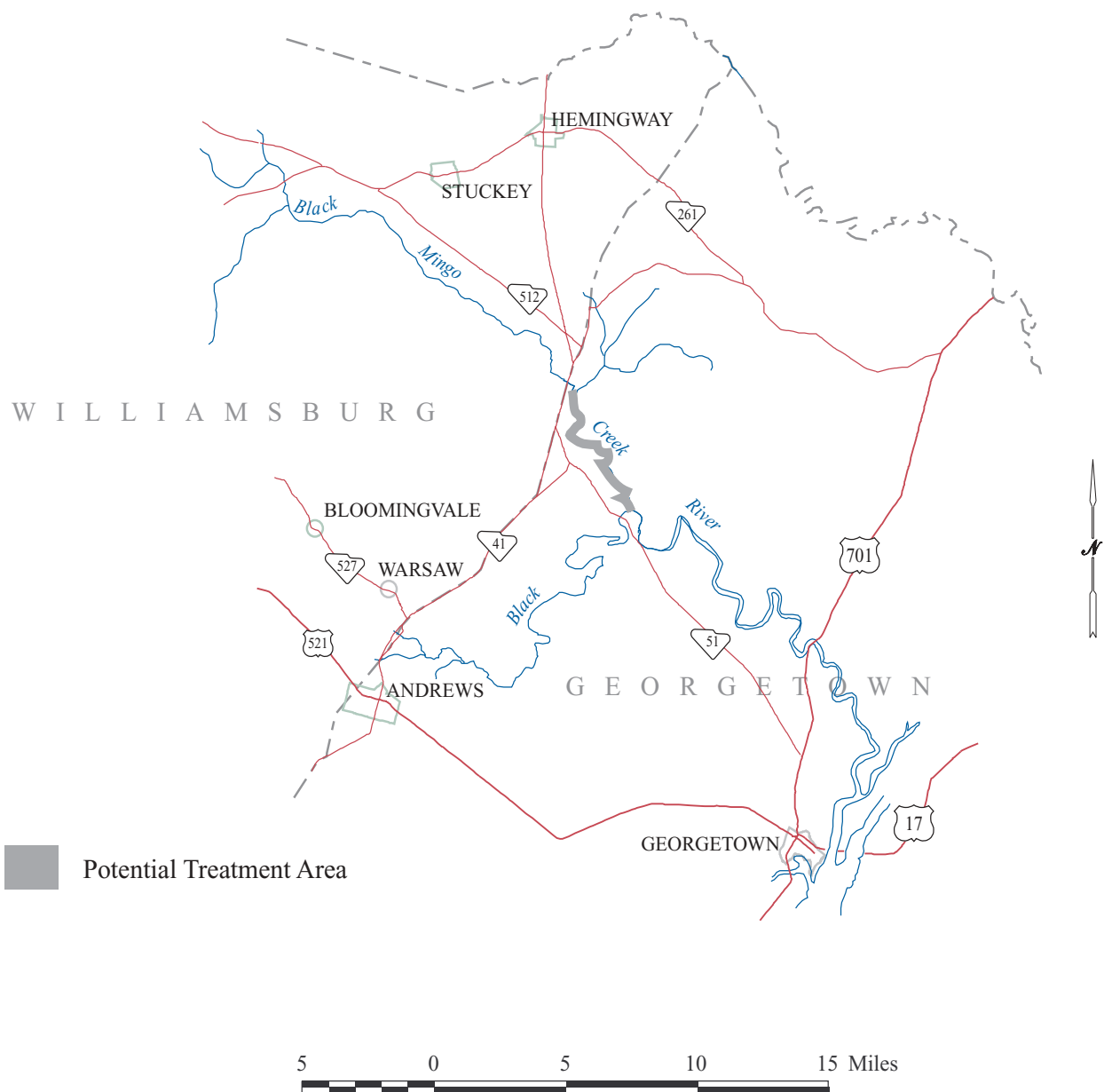
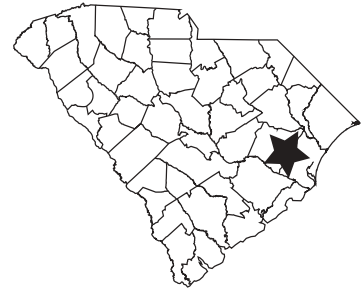
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups.

Black Mingo Creek



4. Black River

(Georgetown County)

1. Problem plant species

Alligatorweed

Frog's bit

Parrot feather

Pennywort

2. Management objective

Reduce or remove nuisance weed infestation at public access points, the main river channel, and connecting lakes to improve water quality and navigation.

3. Selected control method

Problem Species

Alligatorweed, Pennywort

Frog's bit, Parrot feather

Control Agent

Renovate 3, Habitat /Glyphosate

Reward

4. Area to which control is to be applied

30 acres of problematic plants throughout river

5. Rate of control agent to be applied

Reward - 0.5 gallon per acre.

Renovate 3 - 0.5-0.75 gallons per acre.

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.

6. Method of application of control agent

Spray on surface of foliage with appropriate surfactant.

7. Timing and sequence of control application

Apply when plants are actively growing (May - Oct.).

8. Other control application specifications

None

9. Entity to apply control agent

Commercial applicator

10. Estimated cost of control operations

\$3,790

11. Potential sources of funding

Georgetown County 30%

U.S. Army Corps of Engineers 40%

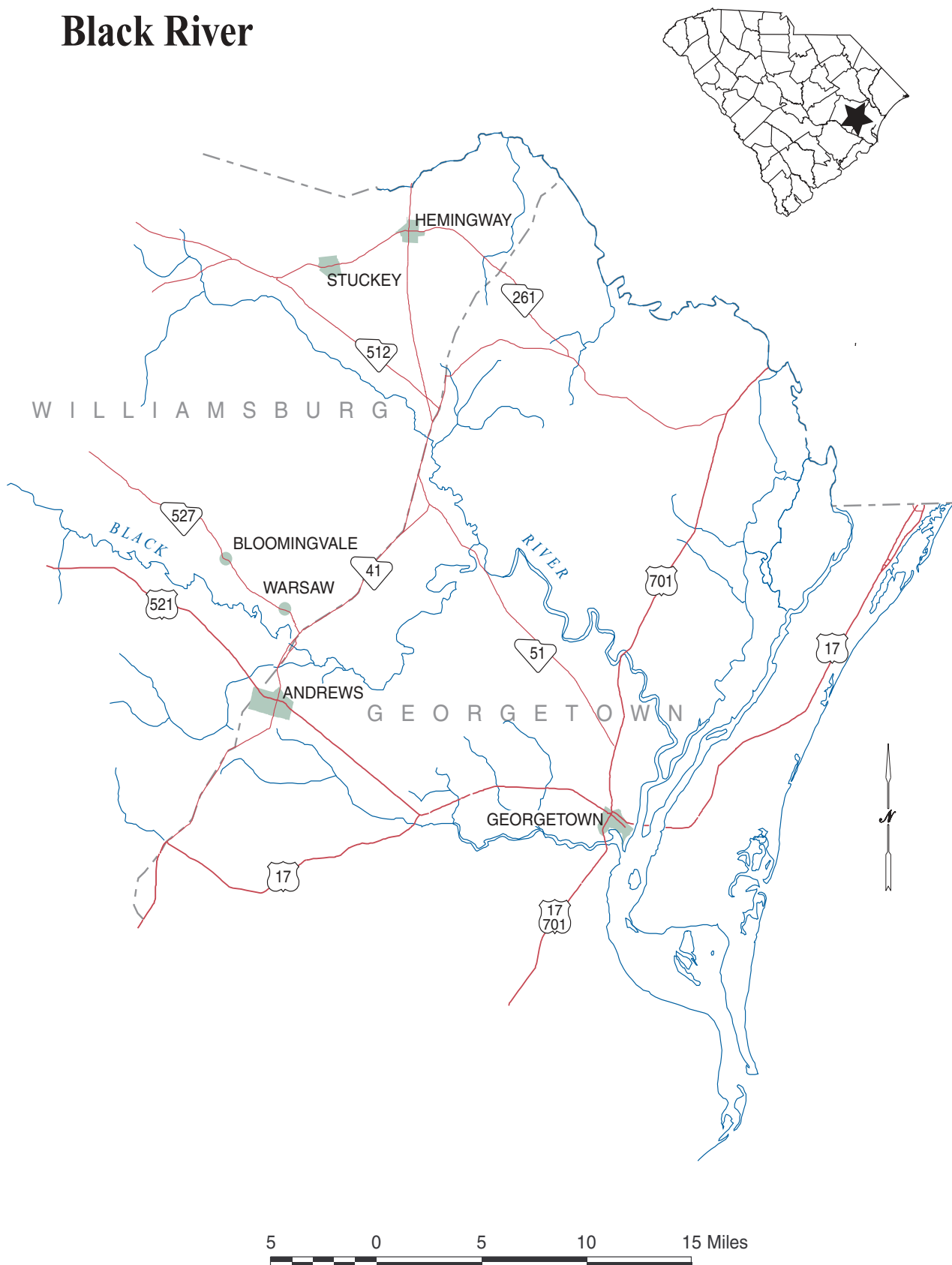
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.

Black River



5. Bonneau Ferry

(Berkeley County)

1. Problem plant species

Water Primrose	Water hyacinth	Cattails
Lotus	Cutgrass	Pennywort
Frog's bit	Parrotfeather	

2. Management objective

Reduce nuisance plant populations to the greatest extent possible throughout Bonneau Ferry impoundments to enhance water quality, water flow, waterfowl habitat, fishing, and hunting opportunities.

3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Water primrose, Pennywort	Renovate 3, Habitat/Glyphosate
Cattails, Cutgrass, Parrotfeather	Habitat/Glyphosate
Water hyacinth, Frog's bit	Renovate 3, Reward

4. Area to which control is to be applied

75 acres of problematic plants throughout the reserves and impoundments of Bonneau Ferry.

5. Rate of control agent to be applied

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
Reward - 2 quarts per acre.
Renovate 3 - up to 4 quarts per acre.

6. Method of application of control agent

Helicopter - 25 acres of Habitat/glyphosate mix with appropriate surfactant.
Other applications - Spray on surface of foliage with appropriate surfactant from boat..

7. Timing and sequence of control application

Apply when plants are actively growing.

8. Other control application specifications

None

9. Entity to apply control agent

Commercial applicator

10. Estimated cost of control operations

\$20,326.

11. Potential sources of funding

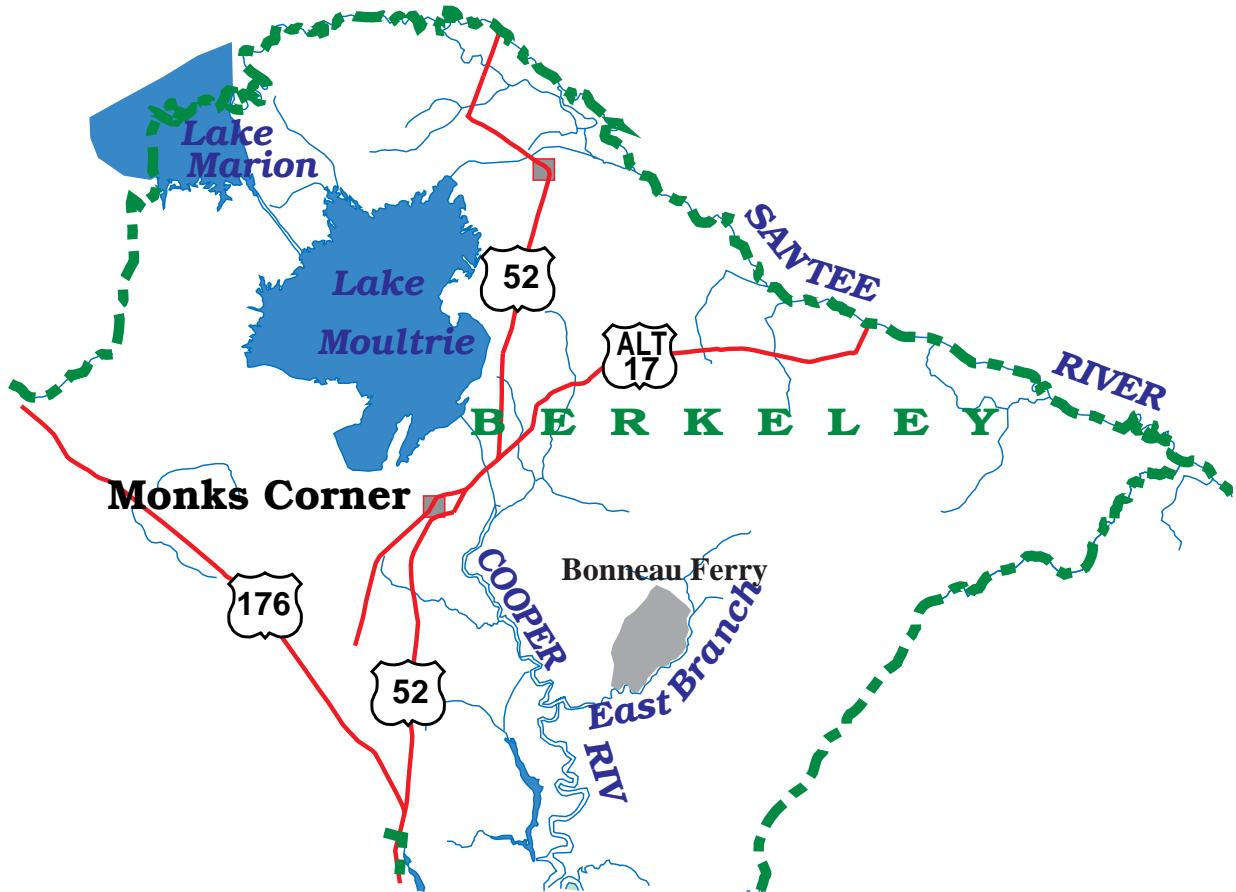
S. C. Department of Natural Resources 100%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Bonneau Ferry



6. Combahee River (Borrow pit)

(Colleton County)

1. Problem plant species
Alligatorweed, Parrot feather, Frog's bit
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Alligatorweed	Renovate 3, Habitat/Glyphosate
Frog's bit, Parrot feather	Reward
4. Area to which control is to be applied
12 acres of problematic plants.
5. Rate of control agent to be applied
Reward - 0.5 gallon per acre.
Renovate 3 - 0.50-0.75 gallons per acre.
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Apply when plants are actively growing (May - Oct.).
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$1,712

11. Potential sources of funding

Colleton County 30%

U.S. Army Corps of Engineers 40%

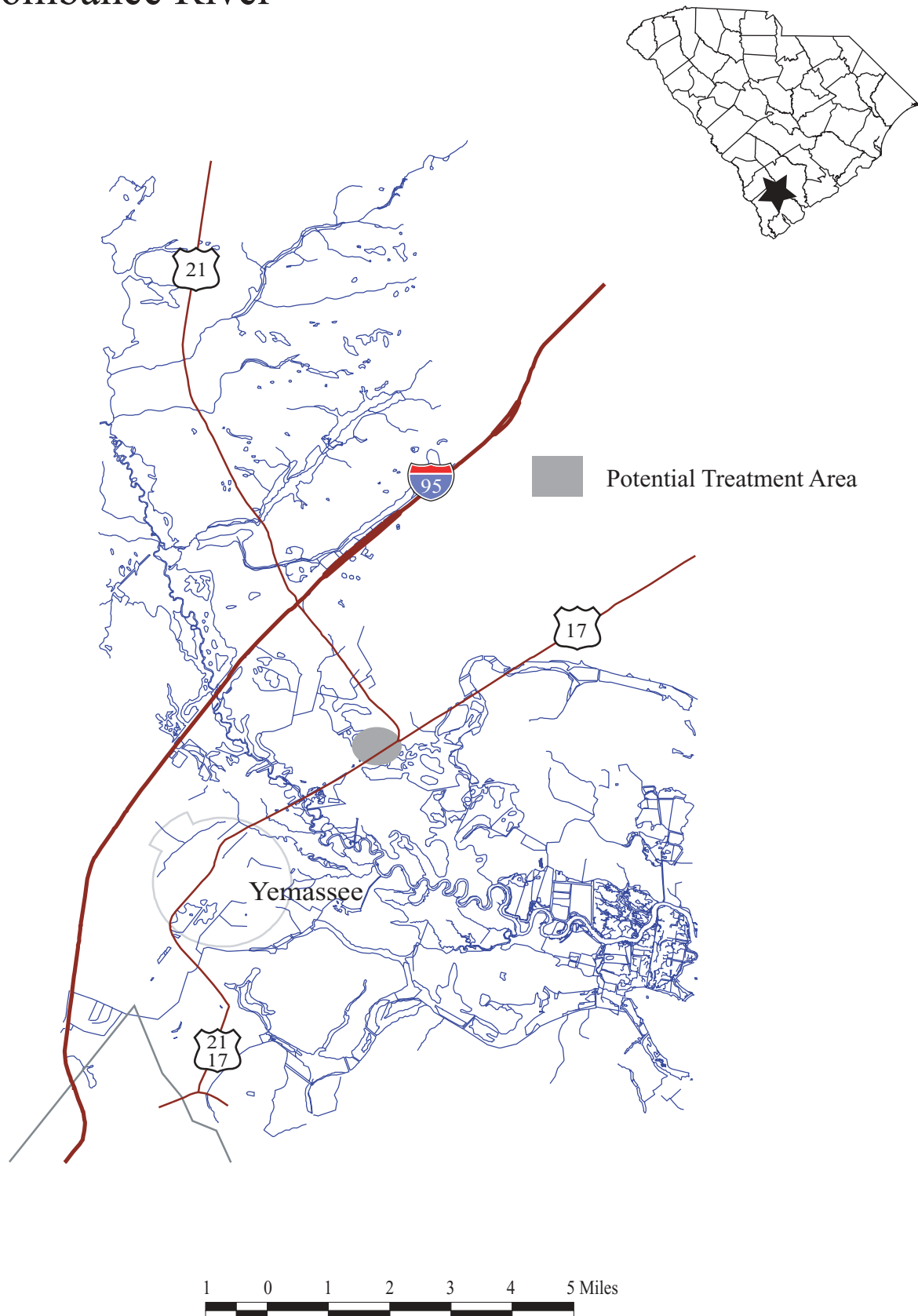
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups.

Combahee River



7. Cooper River

(Berkeley County)

1. Problem plant species

Hydrilla, Water hyacinth, Water primrose

2. Management objectives

- a. Reduce water hyacinth populations to the greatest extent possible in the main river and public ricefields.
- b. Reduce water primrose growth along boat channels to maintain navigation.
- c. Open limited boat trails in hydrilla infested ricefields to enhance public access to the river and selected ricefields.

3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Water hyacinth	Renovate 3, Reward
Water primrose	Renovate 3, Reward, Habitat/Glyphosate
Hydrilla	Chelated copper*

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Renovate 3, Reward, Habitat,/Glyphosate - 600 acres of water hyacinths and water primrose throughout river system and in narrow boat channels in French Quarter Creek, Rice Hope Plantation ricefield, and Berkeley Yacht Club ricefield.

Chelated copper - 60 acres (30 acres treated twice yearly, spring and fall) to open boat trails in Pimlico, Berkeley Yacht Club and Rice Hope Plantation ricefields.

5. Rate of control agents to be applied

Reward - 0.5 gallon per acre.

Renovate 3 - 0.50-0.75 gallons per acre.

Chelated copper - up to 1 ppm (about 16 gallons per acre).

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.

6. Method of application of control agent

Renovate 3, Reward, Habitat/Glyphosate- spray on surface of foliage with appropriate surfactant.

Chelated copper - subsurface injection from airboat.

7. Timing and sequence of control application

All agents to be applied when plants are actively growing. Renovate 3 treatments to be conducted in early spring with subsequent Reward maintenance treatments throughout the year. Chelated copper treatment of boat trails to be conducted as close to low tide as possible to minimize water movement.

8. Other control application specifications

None

9. Entity to apply control agent

Commercial applicator

10. Estimated cost of control operations

\$83,957

11. Potential sources of funding

Berkeley County 30%

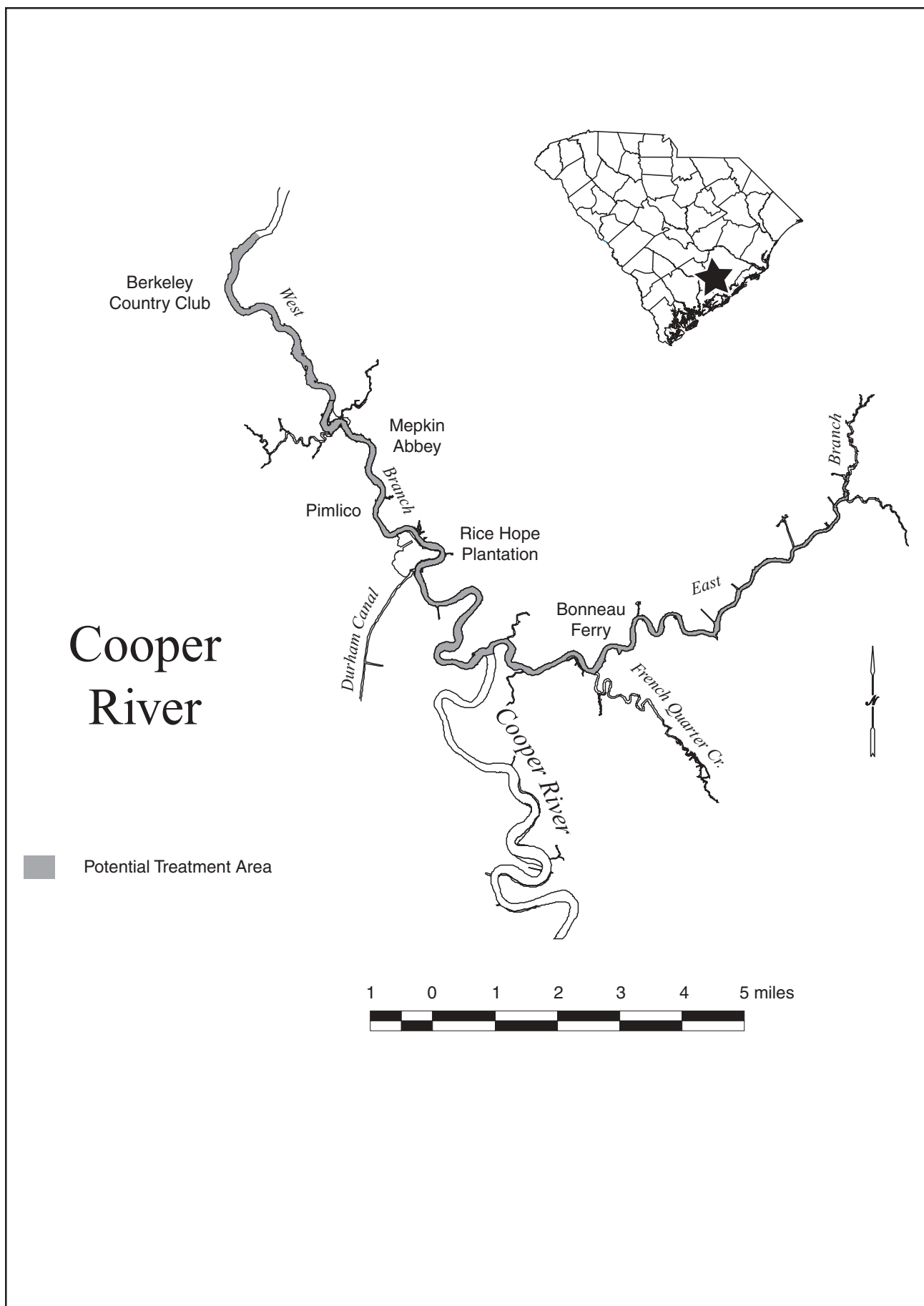
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to wateruse, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Long term management must include consideration of water hyacinth control in many privately owned ricefields to which the public does not have boat access. Water hyacinth from these ricefields can reinfest public areas.



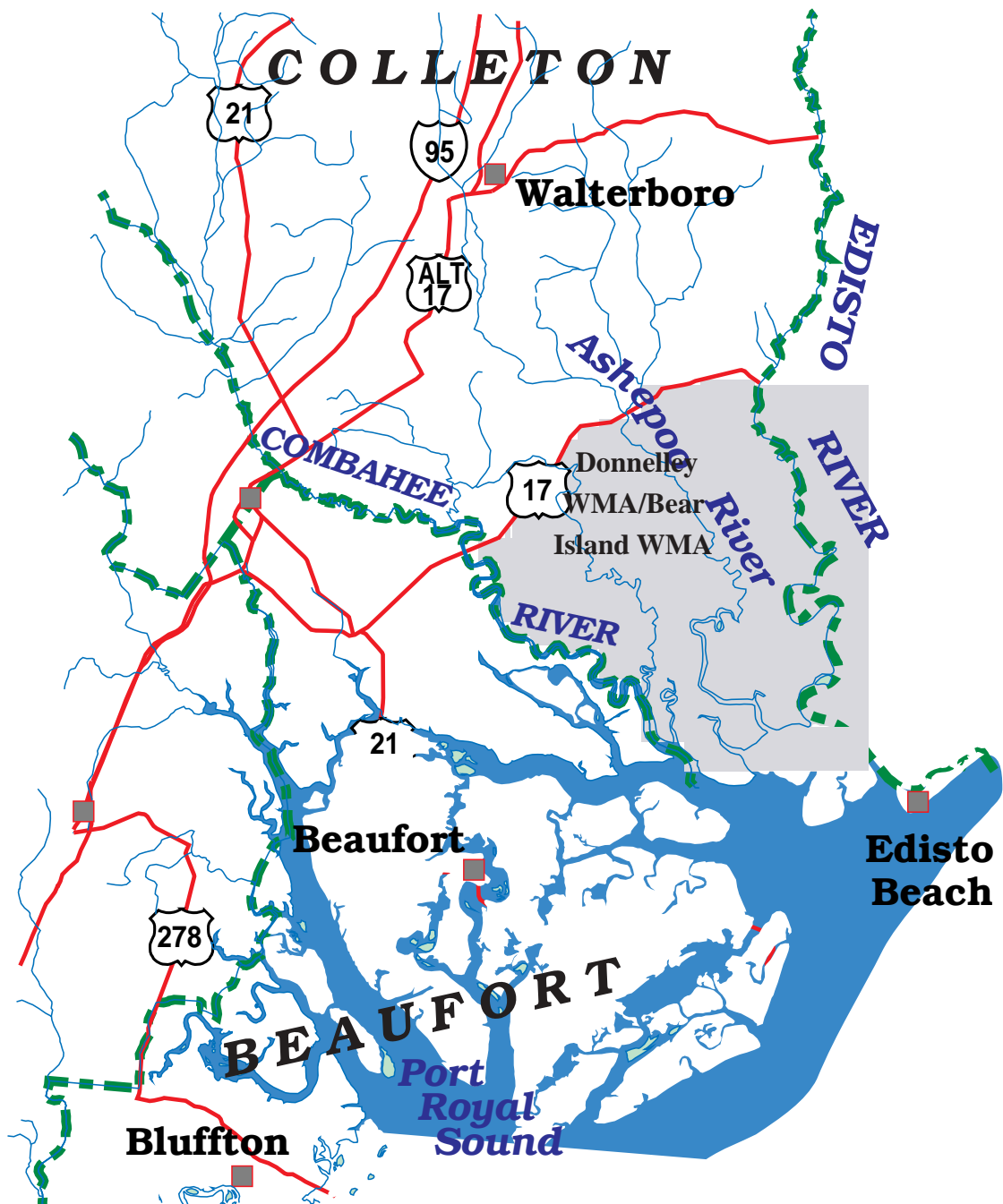
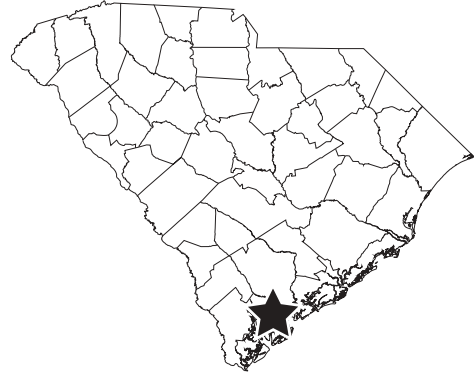
(Colleton County)

- (Percentage of match subject to change based on availability of Federal and State funding.)*

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Donnelley/Bear Island



9. Goose Creek Reservoir

(Berkeley County)

1. Problem plant species

Water hyacinth
Water lettuce

Water primrose

2. Management objective

- a. Reduce water hyacinth and water lettuce populations to the greatest extent possible throughout the lake.
- b. Reduce water primrose, water lettuce and water hyacinth in the upper portion of the lake to enhance water flow and public access.

3. Selected control method

Problem Species

Water primrose

Water hyacinth

Water lettuce

Control Agent

Renovate 3, Habitat/Glyphosate

Renovate 3, Reward

Renovate 3, Reward

4. Area to which control is to be applied

Renovate 3, Habitat, Glyphosate - 50 acres water primrose in upper lake and boat ramp.

Reward - 100 acres of water hyacinth and water lettuce throughout lake.

Renovate 3 - 100 acres of water hyacinth and water lettuce throughout lake.

5. Rate of control agents to be applied

Renovate 3 - 0.50-0.75 gallons per acre.

Reward - 0.5 gallon per acre.

Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.

6. Method of application of control agents

Renovate 3, Habitat, Glyphosate, Reward - spray on surface of foliage with appropriate surfactant.

7. Timing and sequence of control application

All agents to be applied when plants are actively growing.

8. Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time. Coordinate all control operations with Charleston Commissioners of Public Works and Goose Creek Reservoir Watershed Task Force.

Hydrilla continues to be adequately controlled by sterile grass carp. However, hydrilla populations will be carefully monitored and in the event that significant regrowth occurs during the year the Aquatic Plant Management Council may consider the need for additional grass carp.

9. Entity to apply control agents

Commercial Applicator

10. Estimated cost of control operations

\$28,010

11. Potential sources of funding

Charleston Commissioner of Public Works 30%

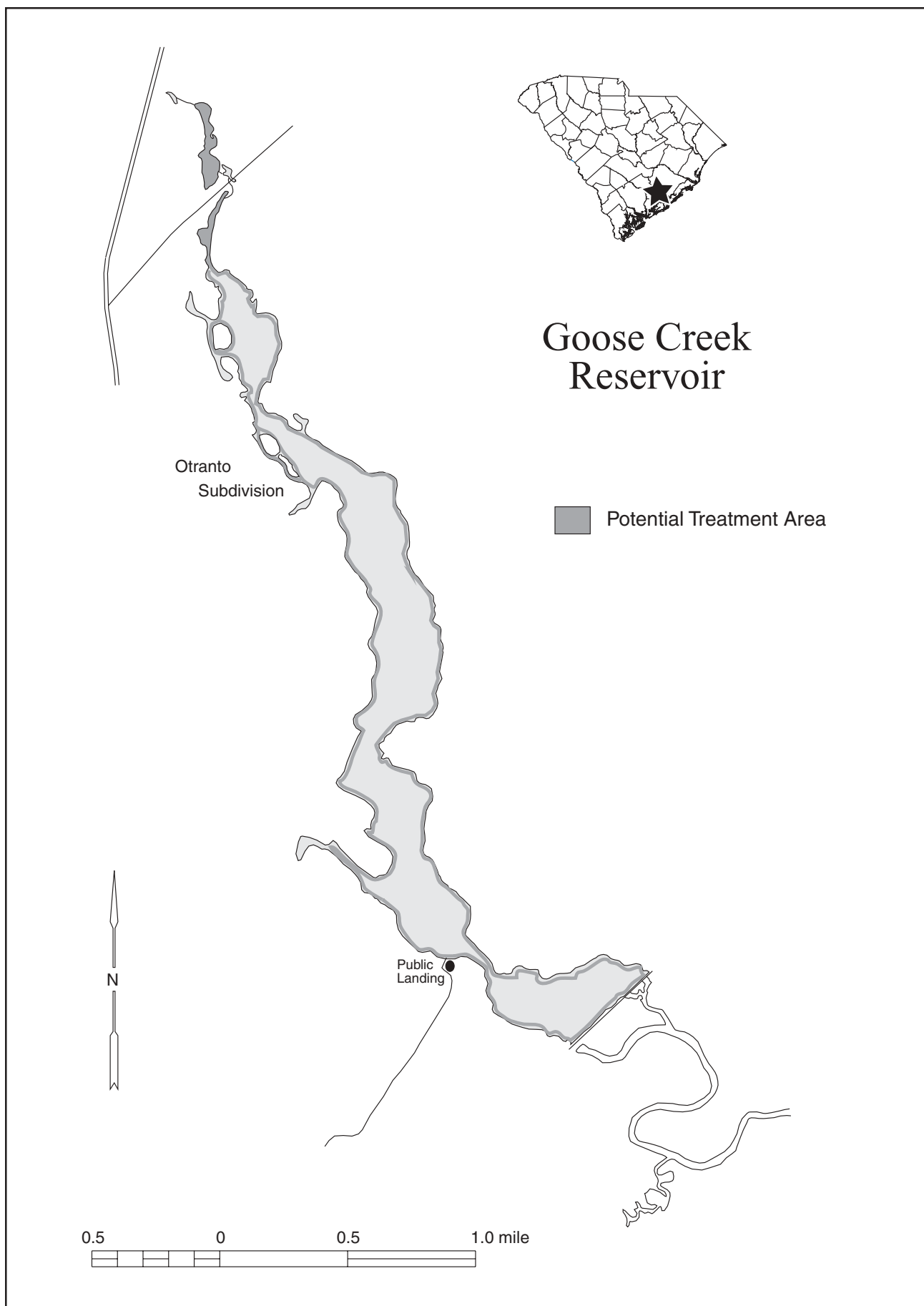
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



10. Lake Greenwood

(Greenwood and Laurens County)

1. Problem plant species
 - Slender naiad
 - Hydrilla
2. Management objectives
 - a. Reduce slender naiad in developed shoreline areas and areas of high public access and use.
 - b. Eliminate hydrilla from Rabon Creek arm.
3. Selected control method

<u>Problem Species</u>	<u>Control Agent</u>
Slender naiad, Hydrilla	Aquathol K
4. Area to which control is to be applied
 - Aquathol K - 25 acres of slender naiad infestation.
 - Aquathol K - 40 acres of hydrilla infestation in upper Rabon Creek arm.
5. Rate of control agents to be applied
 - Aquathol K - 0.5 - 4 ppm (about 3- 8 gallons per acre depending on depth)
6. Method of application of control agents
 - Aquathol K - Subsurface application by airboat with adjuvant.
7. Timing and sequence of control application
 - Agent to be applied to slender naiad when plants are actively growing.
 - Agent to be applied to hydrilla when plants are actively growing but prior to tuber production.
8. Other control application specifications
 - Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.
 - Treatment of control area is to be conducted in a manner that will not significantly degrade water quality. Survey and final determination of treatment areas to be conducted in conjunction with the South Carolina Department of Natural Resources district fisheries biologist. In general, treatment will be limited to developed shoreline areas, public access sites, and areas of high public use.
 - Hydrilla may require multiple treatments.

9. Entity to apply control system
Commercial applicator

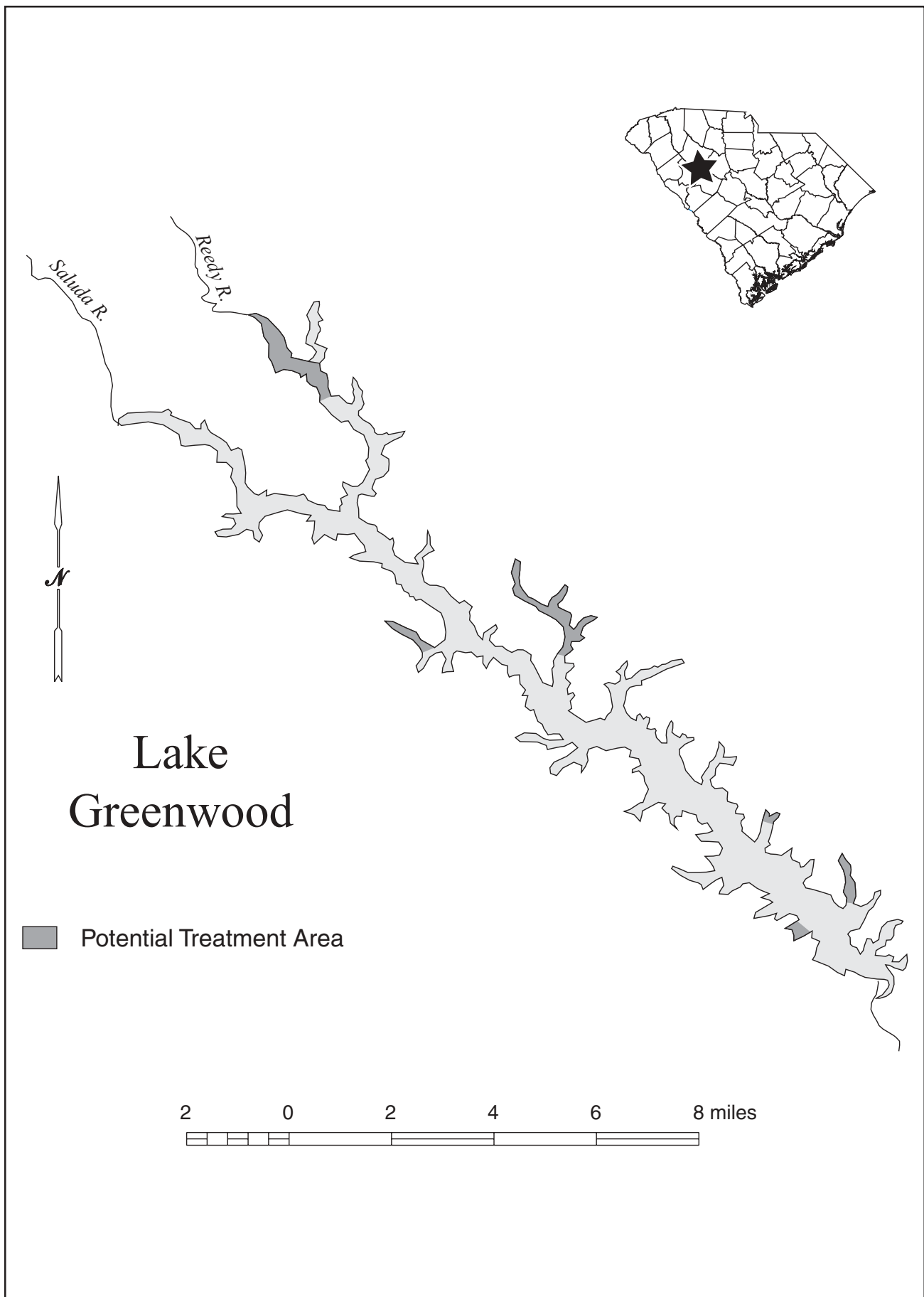
10. Estimated cost of control operations
\$21,624

11. Potential sources of funding
Greenwood County 30%
U.S. Army Corps of Engineers 40%
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



11. Lake Keowee

(Pickens and Oconee County)

1. Problem plant species

Hydrilla

2. Management objectives

Keep hydrilla growth suppressed to minimize its spread within the lake, help prevent its spread to adjacent public waters and minimize adverse impacts to water use activities.

3. Selected control method

Chelated copper *

Fall/winter water level drawdown

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

4. Area to which control is to be applied

Chelated copper - 10 acres

Drawdown - entire lake

5. Rate of control agent to be applied

Chelated copper - up to 1 ppm (about 16 gallons per acre)

Drawdown - to the greatest extent possible within project limits.

6. Method of application of control agent

Chelated copper - subsurface injection by airboat with adjuvant.

Drawdown - draw lake down.

7. Timing and sequence of control application

Herbicide application - when plants are actively growing.

Drawdown - drawdown lake from October through February.

8. Other control application specifications

Herbicide application - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

9. Entity to apply control system

Herbicide application - Commercial applicator or Duke Power Company

Drawdown - Duke Power Company

10. Estimated cost of control operations

Herbicide application - \$2,279

Drawdown - Undetermined

11. Potential sources of funding

Duke Power Company 30%

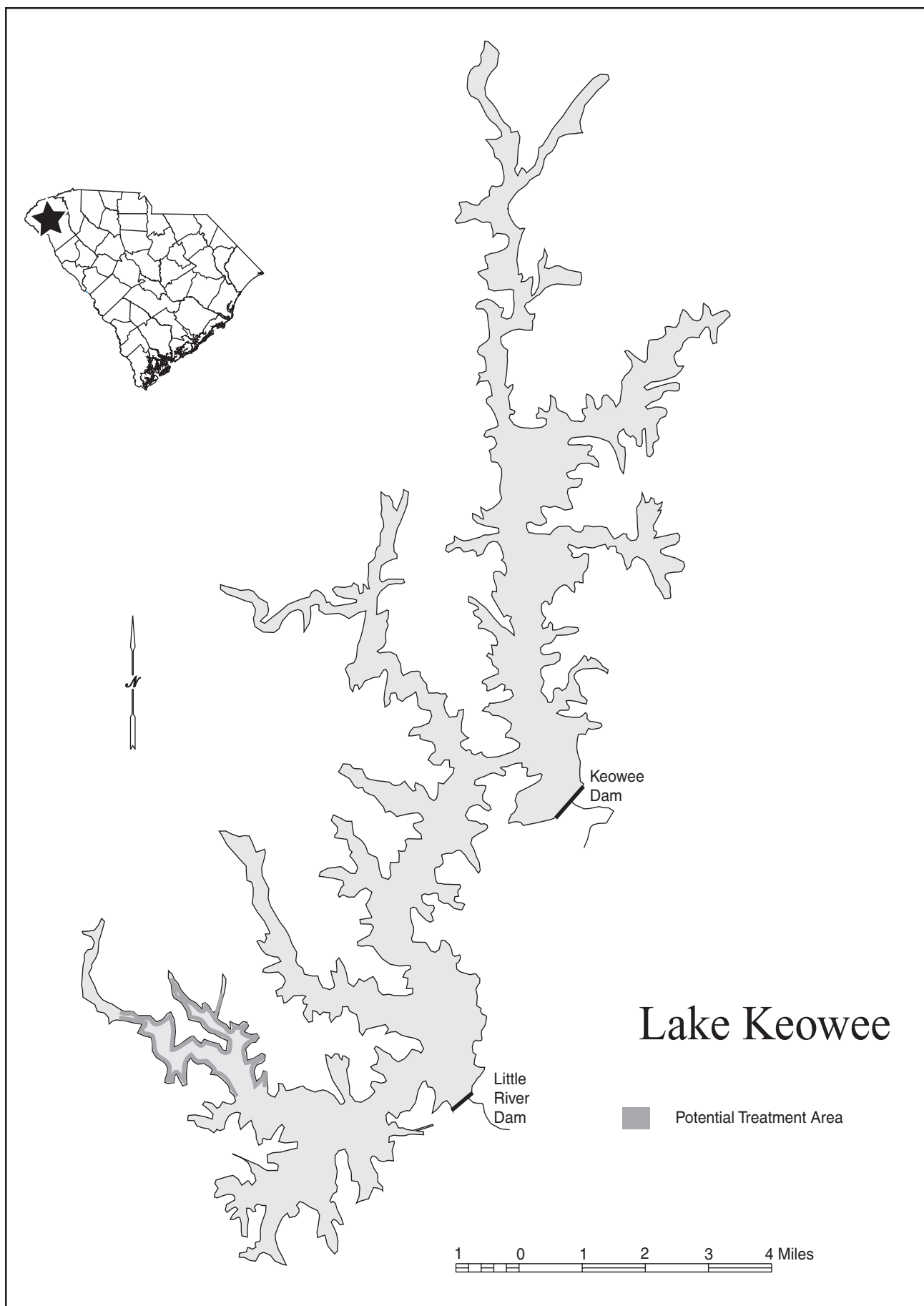
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



12. Lake Marion

(Calhoun, Clarendon, and Sumter Counties)

1. Problem plant species

Hydrilla	Alligatorweed
Brazilian elodea	Fanwort
Water hyacinth	Slender naiad
Water primrose	Giant Cutgrass
Coontail	Filamentous algae (Lyngbya)
Slender Pondweed	

2. Management objectives

- a. Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.
- b. Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.
- c. Reduce water hyacinth populations throughout the lake, especially in the area above the I-95 bridge, to enhance boating, fishing, hunting, and public access.
- d. Reduce giant cutgrass populations throughout the lake, especially in the Santee Cooper Wildlife Management Area and upper lake near Lowfalls landing, to enhance waterfowl habitat and hunting opportunities.
- e. Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake and subimpoundments.

3. Selected control method

<u>Problem Species</u>	<u>Control Agents</u>
Hydrilla	Aquathol K, Sonar, chelated copper*, Triploid grass carp**
Brazilian elodea, Lyngbya	Reward, chelated copper*, Hydrothol 191*
Water hyacinth	Reward

Fanwort, coontail, slender naiad,	Aquathol K, Sonar, Hydrothol 191*
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Habitat, Renovate 3
Slender pondweed	Triploid grass carp**

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

**** Triploid grass carp stocked in previous years substantially reduced hydrilla coverage in the main bodies of Lakes Marion and Moultrie during 1996-2004. Consequently, no additional grass carp stockings are planned for these areas in 2005. Stated stockings are only in impounded areas adjacent to Lake Marion and the design of the impoundments will not allow the fish to move into Lake Marion. However, hydrilla populations and potential regrowth will be carefully monitored and in the event that study results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.**

4. Area to which control is to be applied

Water hyacinth - Approximately 300 acres throughout lake but mostly in the upper lake area above I-95 bridge.

Hydrilla - Approximately 125 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake.

Giant Cutgrass - Approximately 100 acres along shoreline areas throughout lake system depending on availability of appropriate herbicides.

Other target species - Approximately 175 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas in the main lake.

Sub-Impoundments -

a. Dean's Swamp Impoundment: This impoundment, in the Wyboo Creek area of Lake Marion, is heavily infested with the invasive aquatic plant Hydrilla (*Hydrilla verticillata*). In order to reduce the likely spread of this plant to Lake Marion, Santee Cooper plans to stock this 120 acre impoundment with sterile Chinese Grass Carp in the spring of 2005. The fish will be stocked at the rate of 15 fish/vegetated acre to control 100 acres of Hydrilla. The impoundment is separated from Lake Marion by SC Highway 260 causeway with one water control structure. The design of this structure will not allow the fish to move into Lake Marion.

b. Potato Creek Impoundment: This impoundment, at the headwaters of Potato Creek in Lake Marion, is infested with the invasive aquatic plant Hydrilla, (*Hydrilla verticillata*). In order to reduce the likely spread of this plant to Lake Marion, Santee Cooper plans to transition from a hydrilla dominant plant community to one dominated by native plant species beneficial to waterfowl. As this water body is a Wildlife Management Area for waterfowl, Santee Cooper will coordinate closely with Department of Natural Resources wildlife managers and other appropriate staff and herbicide company technical representatives in developing and implementing control and revegetative plans for 2005.

c. Church Branch Impoundment: This impoundment, in the Wyboo Creek area of Lake Marion, is heavily populated with slender pondweed, (*Potamogeton pusillus*), particularly around the shoreline. As this area is completely surrounded by residential property and is utilized primarily for swimming and boating, Santee Cooper plans to stock this 90 acre impoundment with sterile Chinese Grass Carp in the spring of 2005. The fish will be stocked at the rate of 15 fish/vegetated acre to control 50 acres of vegetation. The impoundment is separated from Lake Marion by SC Highway 260 causeway with one water control structure. The design of this structure will not allow the fish to move into Lake Marion.

5. Rate of control agents to be applied

Aquathol K - 6 to 10 gallons per acre (dependent on water depth)

Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants

Renovate 3 - 0.5 to 0.75 gallons per acre for emergent species, per label for submersed plants.

Habitat - 1-6 pints per acre

Sonar - 0.075 to 0.15 ppm

Chelated Copper- 1 ppm

Hydrothol 191 - up to 1 ppm

Glyphosate - up to 7.5 pints per acre.

Sonar Q, Sonar PR - up to 20 ppb(approx 5.4 lbs/acre)

Triploid grass carp - (See ** footnote in Section 3 above)

6. Method of application of control agents

Aquathol K, chelated copper, Sonar, Hydrothol 191 - subsurface application by airboat or surface application by helicopter with adjuvant.

Reward - (water hyacinths) spray on surface of foliage using handgun from

airboat or by helicopter with appropriate surfactant;(submersed plants)
subsurface application with adjuvant .

Renovate 3, Glyphosate, Habitat - spray on surface of foliage with appropriate surfactant.

Triploid grass carp - (See ** footnote in Section 3 above)

7. Timing and sequence of control application

Herbicide applications -

All herbicide applications to be applied when plants are actively growing.
Water hyacinth treatments should be initiated in early spring when plant growth begins and continued regularly during the year as needed.

Triploid grass carp - (See ** footnote in Section 3 above)

8. Other control application specifications

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Water hyacinth treatments should be considered a high priority to minimize spread to other areas of the lake system. Treatments should be conducted wherever the plants occur and access by boat is feasible. Frequent treatments in this area will be necessary to meet management objectives.

9. Entity to apply control agents

S.C. Public Service Authority and/or commercial applicator.

10. Estimated cost of control operations

\$125,000

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2005.

11. Potential sources of funding

S.C. Public Service Authority 30%

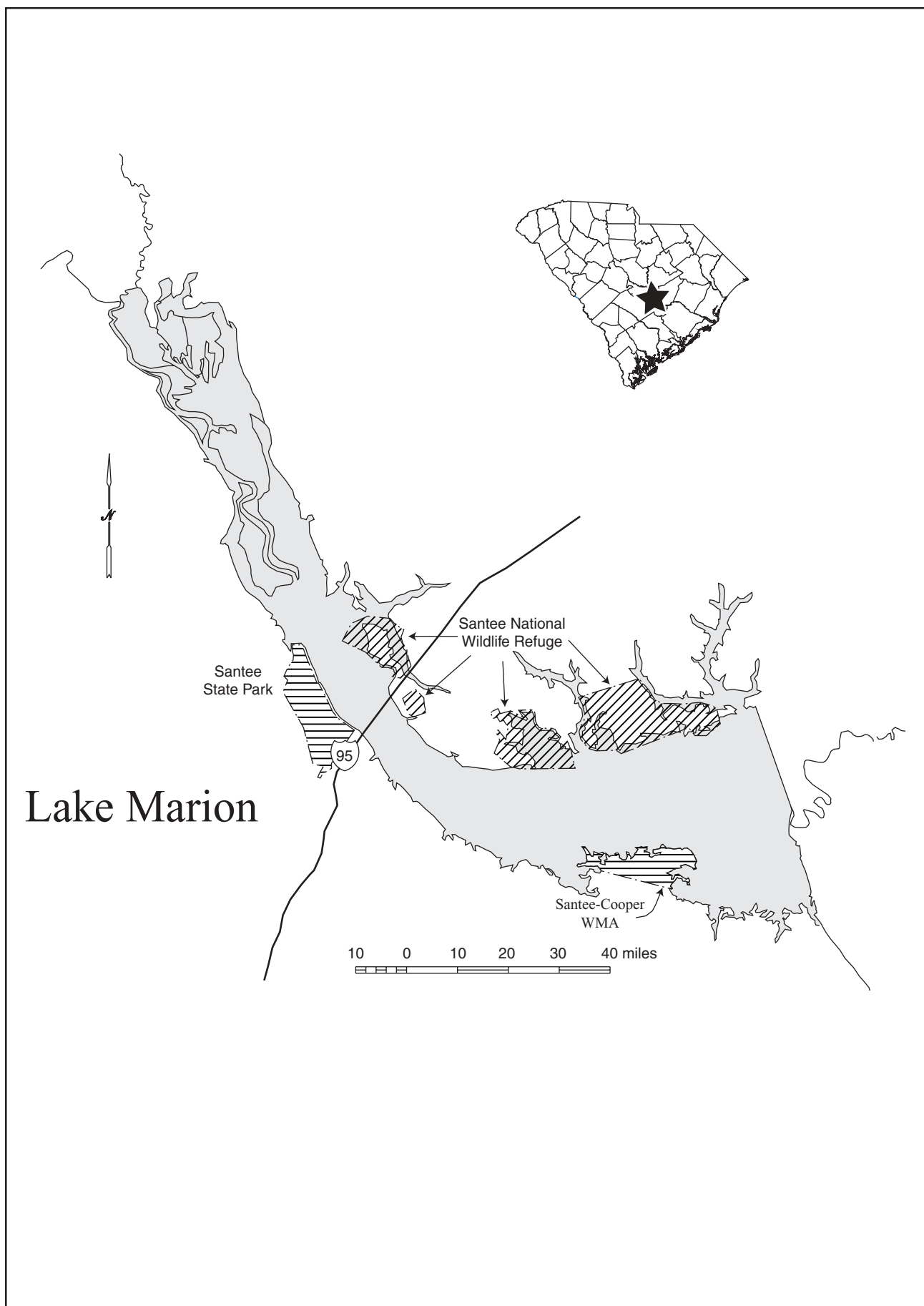
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c. A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include periodic stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- f. Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



13. Lake Moultrie

(Berkeley County)

1. Problem plant species

Hydrilla	Slender naiad
Brazilian elodea	Watermilfoil
Water primrose	Alligatorweed
Fanwort	Water hyacinth
Giant Cutgrass	

2. Management objectives

- Foster a diverse aquatic plant community through selective treatment of nuisance aquatic vegetation (to avoid adverse impacts to existing non-invasive plant species) and the introduction of desirable native plant species.
- Manage hydrilla growth throughout the main lake and subimpoundments to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to electric power generation, agricultural irrigation withdrawals, and public use and access.
- Reduce water hyacinth populations throughout the lake to enhance boating, fishing, hunting, and public access.
- Reduce giant cutgrass populations throughout the lake to enhance waterfowl habitat and hunting opportunities.
- Reduce other nuisance aquatic vegetation in priority use areas, such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

3. Selected control method

<u>Problem Species</u>	<u>Control Agents</u>
Hydrilla	Aquathol K, chelated copper*, Sonar, Triploid grass carp**
Brazilian elodea	Reward, chelated copper*, Sonar
Water hyacinth	Reward
Fanwort, slender naiad, watermilfoil	Aquathol K, Sonar, Hydrothol 191*
Water primrose, alligatorweed, giant cutgrass	Glyphosate, Habitat, Renovate 3

*** May be toxic to fish at recommended treatment rates; however, precautions will be implemented to minimize the risk of fish kills.**

**** Triploid grass carp stocked in previous years substantially reduced hydrilla coverage in the main bodies of Lakes Marion and Moultrie during 1996-2004. Consequently, no additional grass carp stockings are planned for these areas in 2005. However, hydrilla populations and potential regrowth will be carefully monitored and in the event that study results and regrowth warrant, the Aquatic Plant Management Council may reconsider the need for additional grass carp.**

4. Area to which control is to be applied

Hydrilla, fanwort, watermilfoil - Approximately 25 acres in priority areas such as electric power generation facilities, public and commercial access sites (boat ramps, piers, swimming areas, marinas) and residential shoreline areas.

Giant cutgrass, water primrose, alligatorweed - Approximately 75 acres along shoreline areas throughout the lake.

5. Rate of control agents to be applied

Aquathol K - 6 to 10 gallons per acre (dependent on water depth)

Reward - 0.5 gallon per acre for floating plants; two gallons per acre for submersed plants

Renovate 3 - 0.5 to 0.75 gallons per acre for emergent species, per label for submersed plants.

Habitat - 1-6 pints per acre

Sonar - 0.075 to 0.15 ppm in treatment area

Chelated copper - 1 ppm

Hydrothol 191 - up to 1 ppm

Glyphosate- up to 7.5 pints per acre.

Other approved aquatic herbicides - as per label instructions.

Triploid grass carp - (See ** footnote in Section 3 above)

6. Method of application of control agents

Aquathol K, chelated copper, Sonar, Hydrothol 191 - subsurface application by airboat or surface application by helicopter with adjuvant.

Reward - (water hyacinths) spray on surface of foliage using handgun from airboat or by helicopter with appropriate surfactant;(submersed plants) subsurface application with adjuvant .

Glyphosate, Habitat - spray on surface of foliage with appropriate surfactant.

Renovate 3, Glyphosate, Habitat - spray on surface of foliage with appropriate surfactant.

Triploid grass carp - (See ** footnote in Section 3 above)

7. Timing and sequence of control application

All herbicides to be applied when plants are actively growing.

If needed, aerial treatment of hydrilla adjacent to the Rediversion Canal entrance should be performed as early as possible to prevent excessive plant growth and avoid impacts to the St. Stephen Hydropower Plant.

Triploid grass carp - (See ** footnote in Section 3 above)

8. Other control application specifications

Herbicide used only upon approval by the S.C. Department of Health and Environmental Control.

Treatment of the control area is to be conducted in a manner that will not significantly degrade water quality. This may require that only a portion of the control area be treated at any one time.

Treatment of lake, especially near the Rediversion Canal, should be coordinated with hydropower production to avoid excessive flows and maximize herbicide contact time.

9. Entity to apply control agent

S.C. Public Service Authority and/or commercial applicator

10. Estimated cost of control operations

\$15,000

Note: The budgeted amount is based on aquatic plant coverage and treatment needs from previous years. Actual expenditures will depend on the extent of noxious aquatic plant growth in 2005.

11. Potential sources of funding

S.C. Public Service Authority 30%

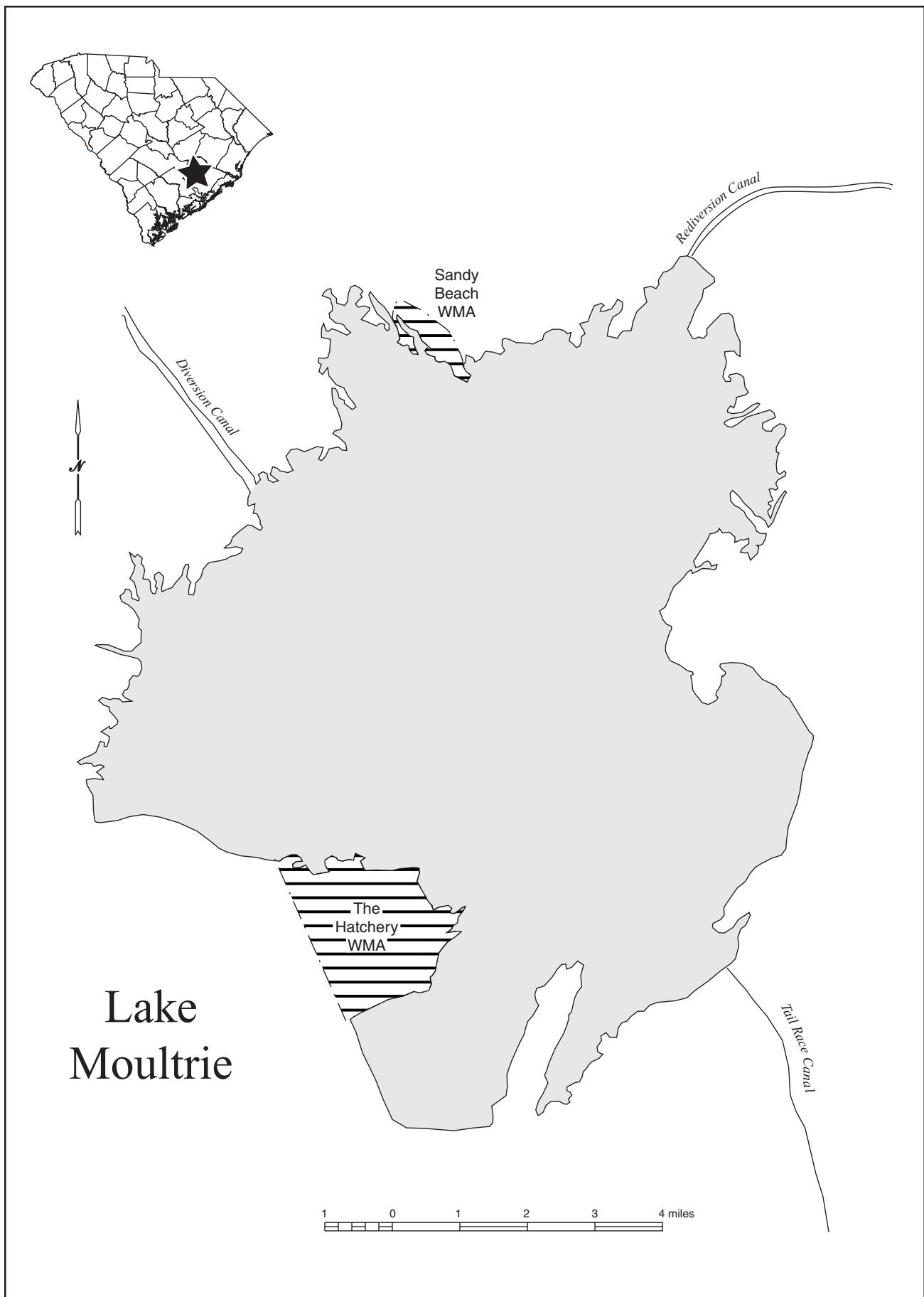
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Support the management goals established by the DNR and Santee Cooper (Appendix E) which attempts to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species.
- b. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- c. A long-term integrated management strategy has been implemented to control hydrilla. Triploid grass carp have been stocked to control hydrilla growth lake-wide and approved aquatic herbicides are used to control localized growth in priority use areas. Future plans include periodic stocking of grass carp to maintain the population at a level that is sufficient to maintain control of hydrilla but to minimize impacts on desirable native plant populations.
- d. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- e. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- f. Periodically revise the management strategy and specific control sites as new environmental data, management agents and techniques, and public use patterns become available.



14. Lake Murray

(Lexington, Newberry, Richland and Saluda Counties)

1. Problem plant species

Hydrilla
Water Primrose

Illinois pondweed

2. Management objectives

- a. Reduce hydrilla and Illinois pondweed growth throughout the lake to minimize its spread within the lake, help prevent its spread to adjacent public waters, and minimize adverse impacts to drinking water withdrawals and public use and access.
- b. Achieve measurable reduction of hydrilla and Illinois pondweed from 2004 levels.
- c. Maintain diverse aquatic plant community through selective application of control methods and introduction of desirable native plant species.

3. Selected control method

- a. Triploid (sterile) grass carp - 64,500 triploid grass carp were stocked in 2003 to control an estimated 4300 acres of hydrilla and Illinois pondweed. No additional grass carp stockings are planned for 2005. However, hydrilla and pondweed growth will be carefully monitored and in the event that growth exceeds 4300 acres the Aquatic Plant Management Council may reconsider the need for additional grass carp.
- b. Mechanical harvester – short-term control in selected areas to provide public access and clear areas around municipal water intakes.
- c. Aquatic herbicides - short-term control in selected areas to provide public access and clear areas around municipal water intakes. Selected control method

Problem Species

Hydrilla

Control Agents

Chelated copper(Nautique)

4. Area to which control is to be applied

- a. If needed, release triploid grass carp in areas of the lake with greatest hydrilla growth.
- b. Use mechanical harvesters or aquatic herbicides to provide immediate short-term control at high priority public access points, such as boat ramps and park sites, and municipal water intakes.

5. Rate of control agent to be applied

- a. If hydrilla acreage in 2005 is greater than the original estimate of 4300 acres, additional grass carp may be stocked for the additional acreage at the rate of 15 fish per vegetated acre following Council approval.
- b. Harvest acreage as needed to provide public use, access and clear areas around municipal water intakes.
- c. Apply aquatic herbicides to provide immediate short-term control at high priority public access points and municipal water intakes.

Chelated copper - up to 1 ppm

6. Method of application of control agent

- a. Triploid grass carp - See section 3 above.
- b. Use mechanical harvester as designed.
- c. All agents to be applied when plants are actively growing.

7. Timing and sequence of control application

- a. If hydrilla coverage is greater than 4300 acres during 2005, additional grass carp may be stocked following Council approval.
- b. Harvest aquatic growth as it becomes problematic; multiple applications are likely.
- c. Apply herbicides to aquatic vegetation as it becomes problematic.

8. Other control application specifications

- a. If needed, all sterile grass carp will be a minimum of 12 inches in length. All sterile grass carp shipments for Lake Murray will be examined by the SCDNR for sterility, size, and condition at the Campbell Fish Hatchery in Columbia prior to stocking in the lake.
- b. Harvested vegetation must be removed from the lake and deposited on high ground. The harvesting process must minimize adverse impacts to fish.
- c. Control by Residential/Commercial Interests:

This plan is designed to provide relief from noxious aquatic vegetation for the public at large. Private entities such as lake-front residents and commercial interests may have site specific concerns not addressed immediately by the use of grass carp or mechanical harvesters at public access areas. **Residential and commercial interests may remove nuisance aquatic vegetation manually or by use of mechanical harvesting devices.** Of the three major control methods the following conditions apply.

1) Mechanical harvesters – Commercial aquatic plant harvesting services may be hired to remove hydrilla and Illinois pondweed from areas adjacent to residential and commercial property after notification of SCE&G. Harvesting precautions as stated in item b. above must be adhered to.

2) Aquatic herbicides – SCE&G opposes regular or general application of herbicides in Lake Murray, therefore, aquatic herbicides may not be applied in the lake by lakefront property owners.

3) Sterile grass carp - A sufficient number of grass carp are being stocked by SCDNR to control nuisance aquatic vegetation. Stocking additional grass carp in Lake Murray without written consent by the SCDNR is prohibited.

9. Entity to apply control agent

- a. Triploid grass carp - Commercial supplier with supervision by the SCDNR.
- b. Mechanical harvester – Commercial harvester under supervision of SCE&G at park sites and public boat ramps; private marina operators to contract for application at commercial boat ramps.
- c. Aquatic herbicides - Commercial applicator under supervision by the SCDNR.

10. Estimated cost of control operations

- a. Triploid grass carp - None anticipated
- b. Mechanical harvester - \$500-1000/acre
- c. Aquatic herbicides - \$275 / acre

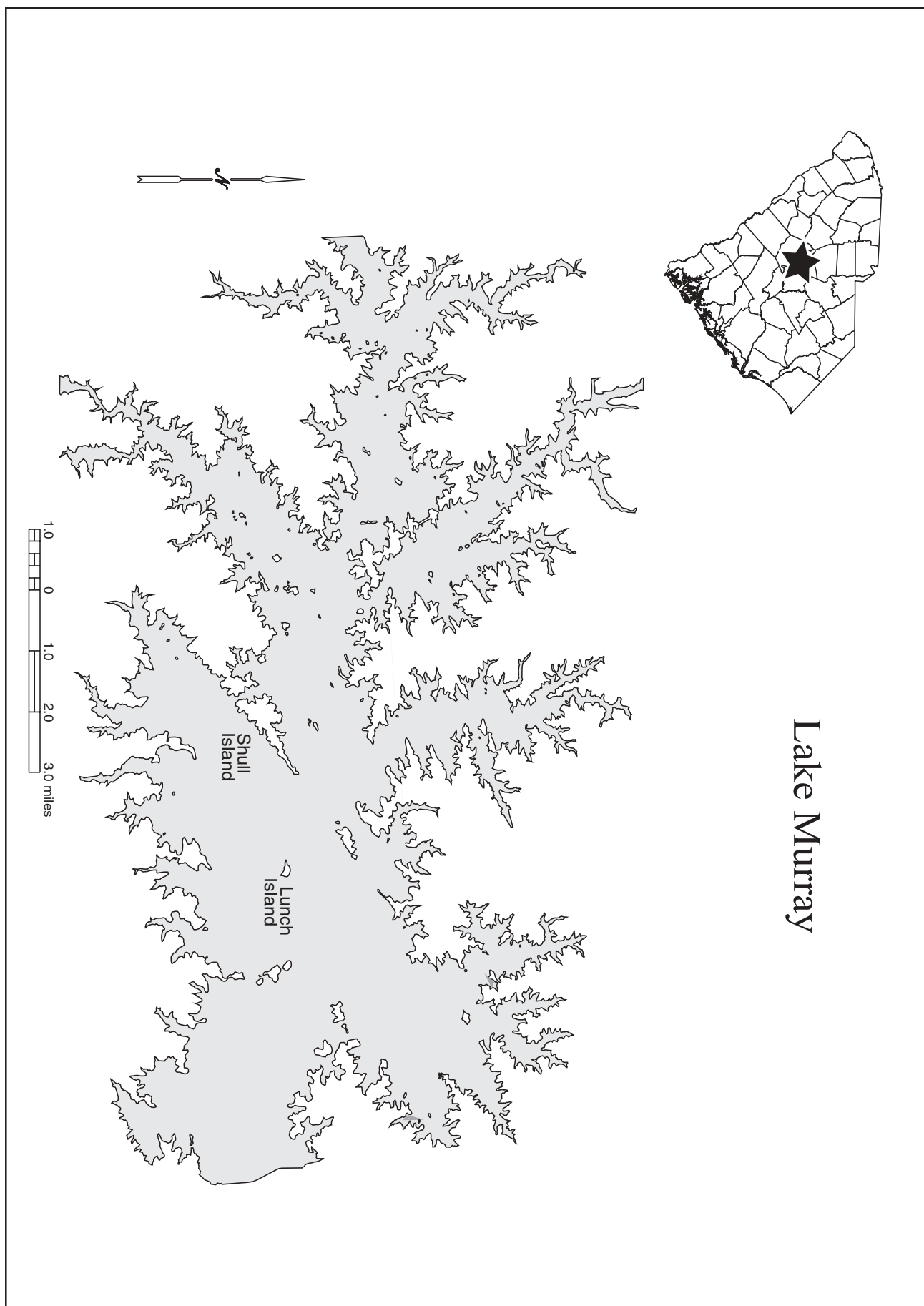
11. Potential sources of funding

- a. Triploid grass carp if needed.
S.C. Electric and Gas Company, Lexington and Richland Counties 30%
U.S. Army Corps of Engineers 40%
S. C. Department of Natural Resources 30%
- b. Mechanical harvester
S.C. Electric and Gas Company, Commercial marina operators, and residential property owners.
- c. Aquatic herbicides
S.C. Electric and Gas Company, Lexington and Richland Counties 30%
U.S. Army Corps of Engineers 40%
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Improve public awareness and understanding of aquatic plant management activities through the maintenance of the Lake Murray Aquatic Plant Management web site. The web site includes up-to-date information on annual management plans, dates and locations of current and historical control operations, locations of habitat enhancement activities, and other pertinent information.
- e. Periodically revise the management strategy and specific control sites as new environmental data and control agents and techniques become available, and public use patterns change.
- f. Water primrose - Water primrose, a shoreline plant, became problematic in the upper portion of the lake last year. The two-year drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor water primrose growth and consider control options if impacts are greater than anticipated.



15. Lake Wateree

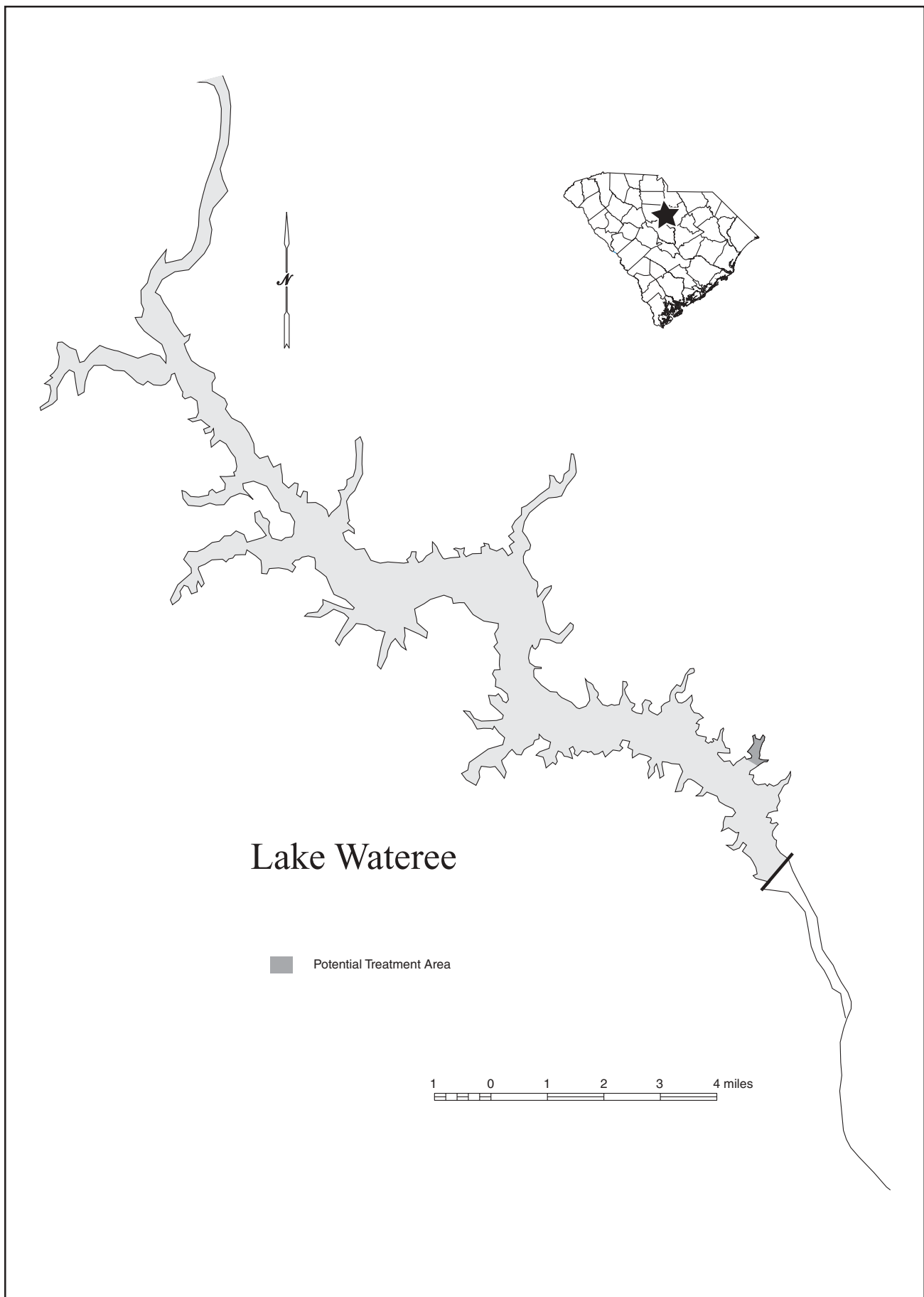
(Fairfield, Kershaw and Lancaster Counties)

1. Problem plant species
Hydrilla
2. Management objective
Keep hydrilla growth suppressed to prevent its spread within the lake, help prevent its spread to adjacent public water, and minimize adverse impacts to water use activities.
3. Selected control method
Aquathol K
Fall/winter water level drawdown
4. Area to which control is to be applied
Aquathol K - At least 2 acres in cove near Lakeside Marina.
Drawdown - Entire lake
5. Rate of control agent to be applied
Aquathol K - 4 ppm (about 8 gallons per acre depending on depth)
Drawdown - To the greatest extent possible within project limits.
6. Method of application of control agent
Aquathol K - Subsurface injection from airboat with adjuvant.
Drawdown - Draw lake down
7. Timing and sequence of control application
Aquathol K - 2 acres treated twice in June and again in fall of year.
Drawdown - Drawdown lake from October through February.
8. Other control application specifications
Aquathol K - Herbicide used only upon notification of all local potable water supply authorities and approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.

Drawdown - Extent and duration of drawdown is dependent on operational limits of hydroelectric project, Federal regulations, electric demand, precipitation, and inflow.

9. Entity to apply control agent
 - Herbicide application - Commercial applicator or Duke Power Company
 - Drawdown - Duke Power Company
10. Estimated cost of control operations
 - Herbicide application - \$2,558
 - Drawdown - Undetermined
11. Potential sources of funding
 - Duke Power Company 30%
 - U.S. Army Corps of Engineers 40%
 - S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)
12. Long term management strategy
 - a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
 - b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
 - c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



16. Little Pee Dee River

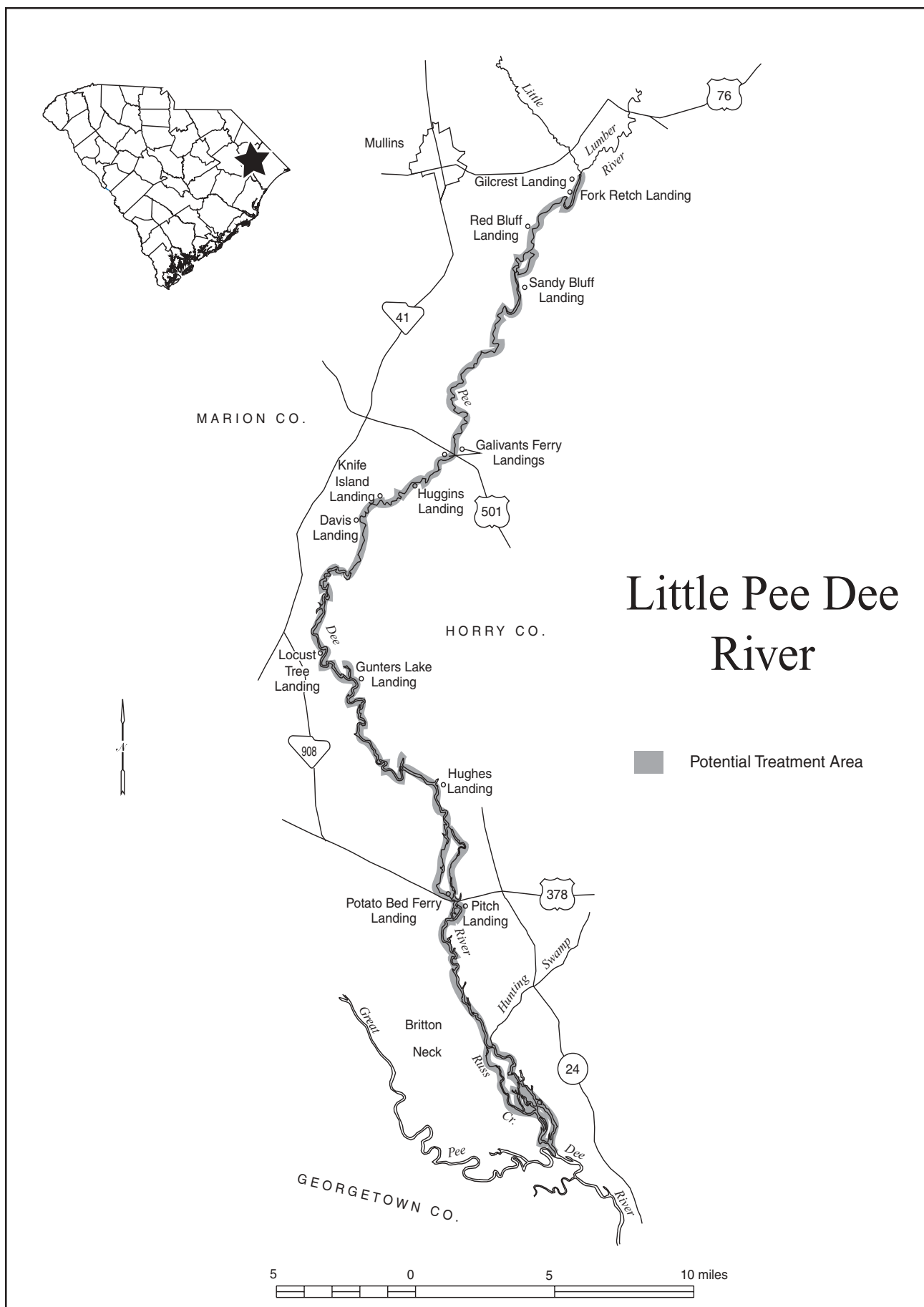
(Marion and Horry Counties)

1. Problem plant species
Alligatorweed
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method
Renovate 3, Habitat/Glyphosate
4. Area to which control is to be applied
50 acres of problematic plants throughout river
5. Rate of control agent to be applied
Renovate 3 - 0.5-0.75 gallons per acre.
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Apply after plants are actively growing (May - Oct.).
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$7,132
11. Potential sources of funding
Horry and Marion Counties 30%
U.S. Army Corps of Engineers 40%
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.



17. Lumber River

(Marion and Horry Counties)

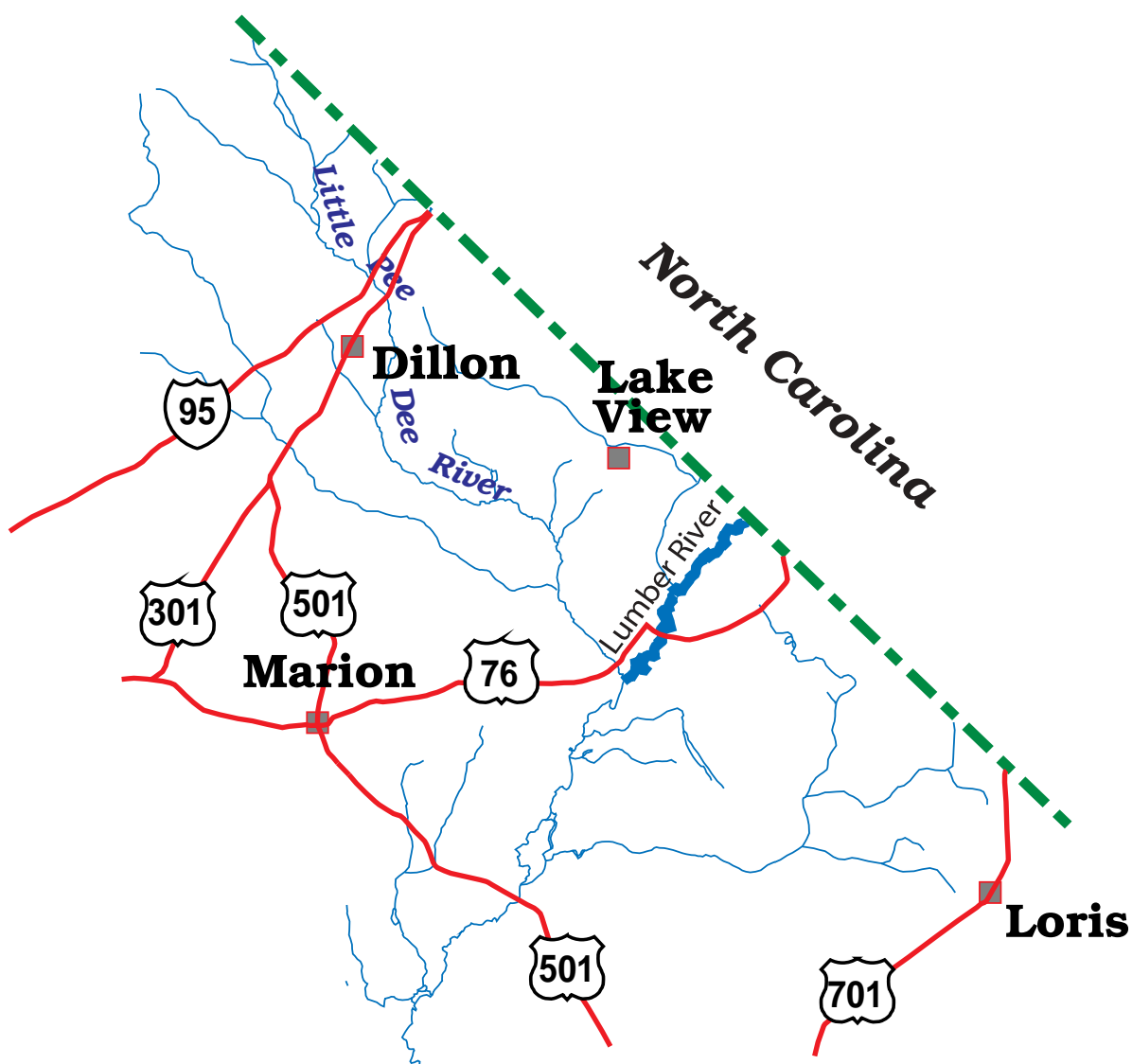
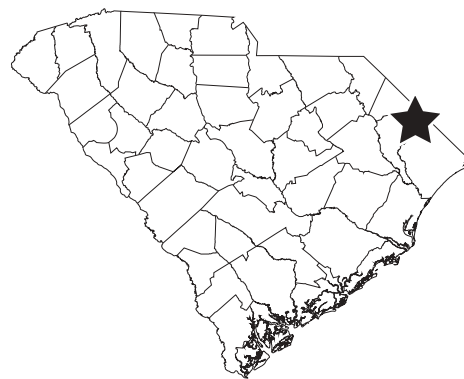
1. Problem plant species
Alligatorweed
2. Management objective
Reduce or remove alligatorweed infestation at public access points, the main river channel, and connecting lakes.
3. Selected control method
Renovate 3, Habitat/Glyphosate
4. Area to which control is to be applied
20 acres of problematic plants throughout river
5. Rate of control agent to be applied
Renovate 3 - 0.5-0.75 gallons per acre.
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Apply after plants are actively growing (May - Oct.).
8. Other control application specifications
None
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$2,853
11. Potential sources of funding
Horry and Marion Counties 30%
U.S. Army Corps of Engineers 40%
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.
- d. Continue to coordinate treatment areas with local conservation groups and State Scenic Rivers Coordinator.

Lumber River



18. Pee Dee River

(Georgetown County)

1. Problem plant species
 - Water hyacinth
 - Phragmites
2. Management objective
 - Reduce water hyacinth and Phragmites populations to the greatest extent possible
3. Selected control method
 - Water hyacinth - Reward
 - Phragmites - Habitat/Glyphosate
4. Area to which control is to be applied
 - 75 acres of water hyacinth throughout river and adjacent public ricefields.
 - 5 acres of phragmites in the Sandy Island area.
5. Rate of control agent to be applied
 - Reward - 0.5 gallons per acre.
 - Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
6. Method of application of control agent
 - Helicopter - 25 acres of reward applied to water hyacinth(Samworth 10 acres, Sandy Island Area 15 acres).
 - Other applications - Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
 - Reward to be applied periodically to water hyacinth from May through October.
 - Glyphosate and Habitat mix - Apply when plants are actively growing.
8. Other control application specifications
 - None
9. Entity to apply control agent
 - Commercial applicator

10. Estimated cost of control operations

\$9,242

11. Potential sources of funding

Georgetown County 30%

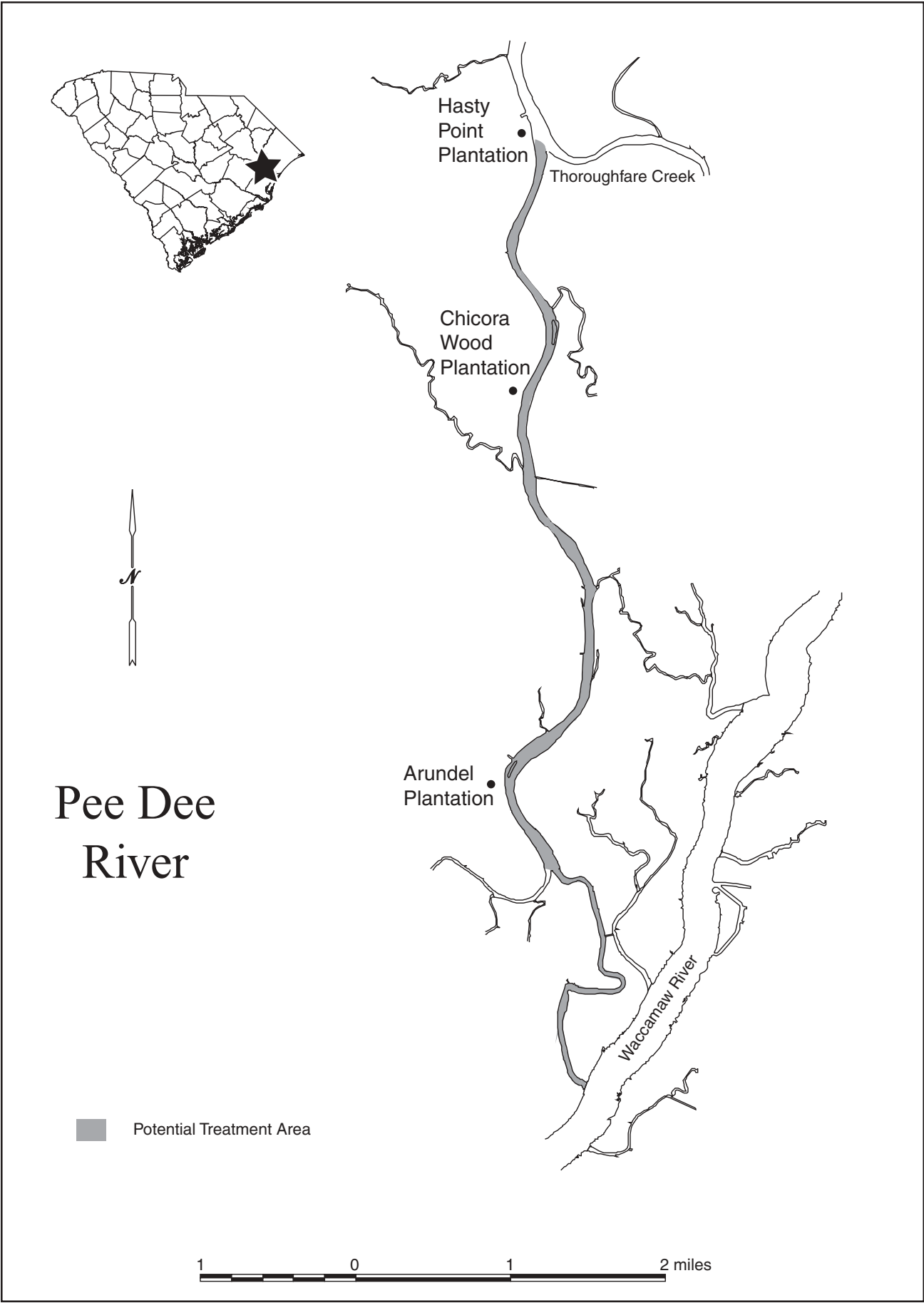
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



19. Santee Coastal Reserve

(Charleston and Georgetown Counties)

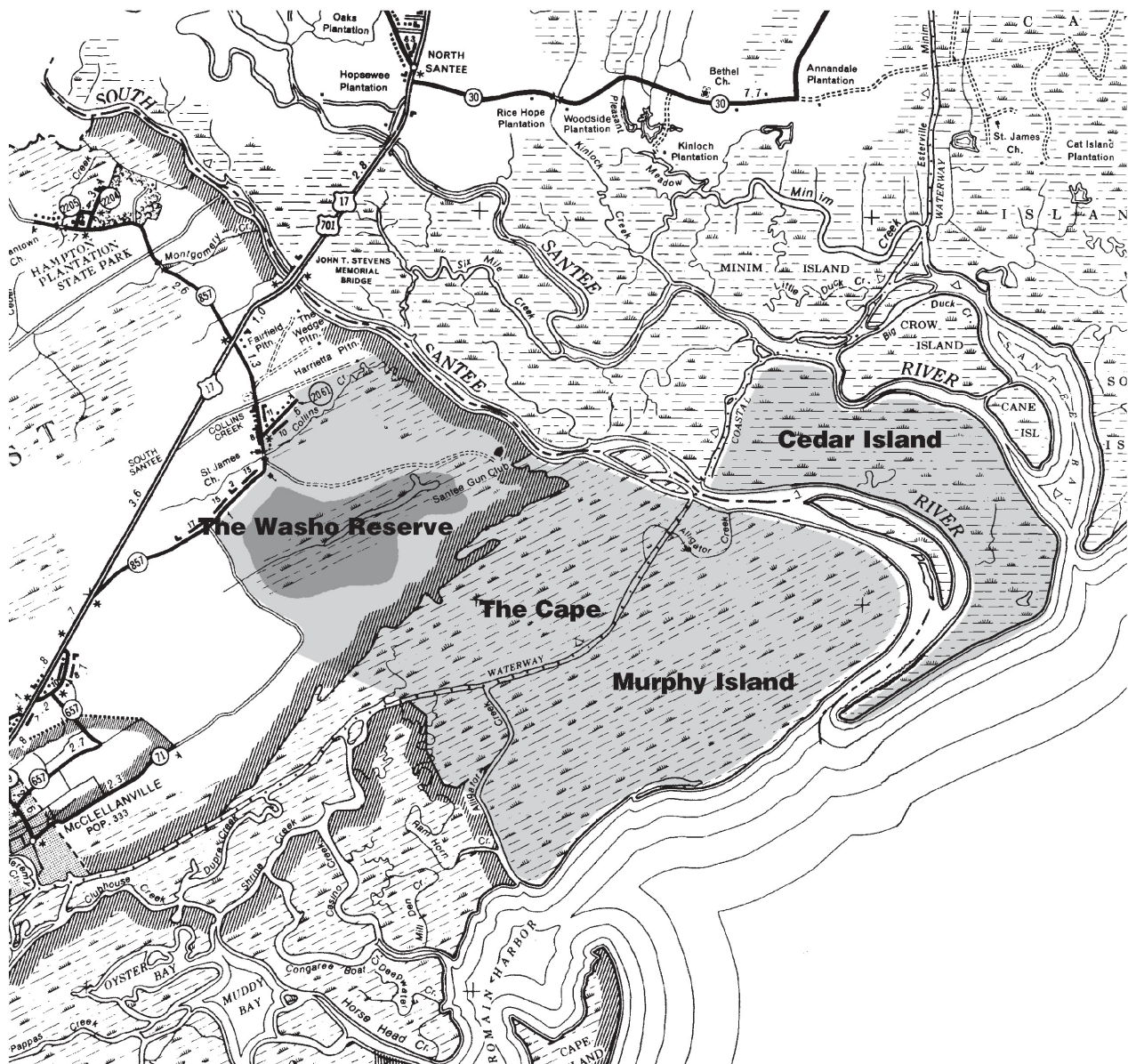
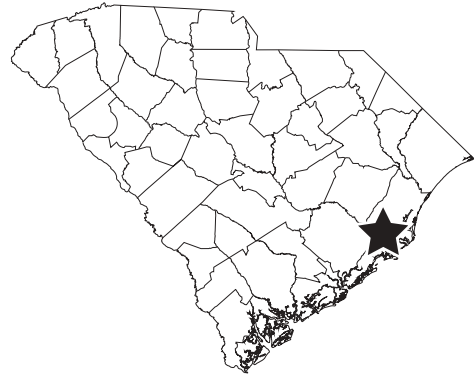
1. Problem plant species
Phragmites
2. Management objective
Reduce Phragmites populations to the greatest extent possible throughout the Santee Coastal Reserve.
3. Selected control method
Habitat/Glyphosate
4. Area to which control is to be applied
250 acres of phragmites throughout the ricefields.
5. Rate of control agent to be applied
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
7. Timing and sequence of control application
Rodeo and Habitat (Imazapyr) mix - Apply when plants are actively growing.
8. Other control application specifications
Application to be conducted by helicopter.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$62,358
11. Potential sources of funding
Santee Coastal Reserve 70%
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Santee Coastal Reserve



20. Santee Delta WMA

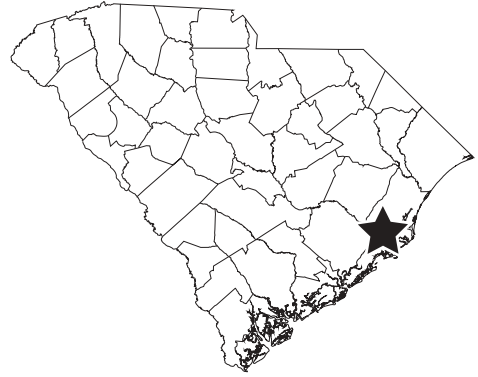
(Georgetown County)

1. Problem plant species
Phragmites
 2. Management objective
Reduce Phragmites populations to the greatest extent possible.
 3. Selected control method
Habitat/Glyphosate
 4. Area to which control is to be applied
30 acres of Phragmites throughout the ricefields.
 5. Rate of control agent to be applied
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
 6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
 7. Timing and sequence of control application
Habitat/Glyphosate - Apply when plants are actively growing.
 8. Other control application specifications
Application to be conducted by helicopter.
 9. Entity to apply control agent
Commercial applicator
 10. Estimated cost of control operations
\$7,483
 11. Potential sources of funding
Santee Coastal Reserve 70%
S. C. Department of Natural Resources 30%
- (Percentage of match subject to change based on availability of Federal and State funding.)*

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Santee Delta WMA



21. Waccamaw River

(HorryCounty)

1. Problem plant species
Water hyacinth
2. Management objective
Reduce water hyacinth populations to the greatest extent possible throughout the river system.
3. Selected control method
Reward
4. Area to which control is to be applied
75 acres throughout river system where needed.
5. Rate of control agent to be applied
0.5 gallons per acre
6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant
7. Timing and sequence of control application
Reward to be applied to water hyacinth periodically from late May through November.
8. Other control application specifications
Herbicide used only upon approval by S.C. Department of Health and Environmental Control. Treatment of control area will be conducted in a manner that will not significantly degrade water quality.
9. Entity to apply control agent
Commercial applicator
10. Estimated cost of control operations
\$ 6,555

11. Potential sources of funding

Horry County 30%

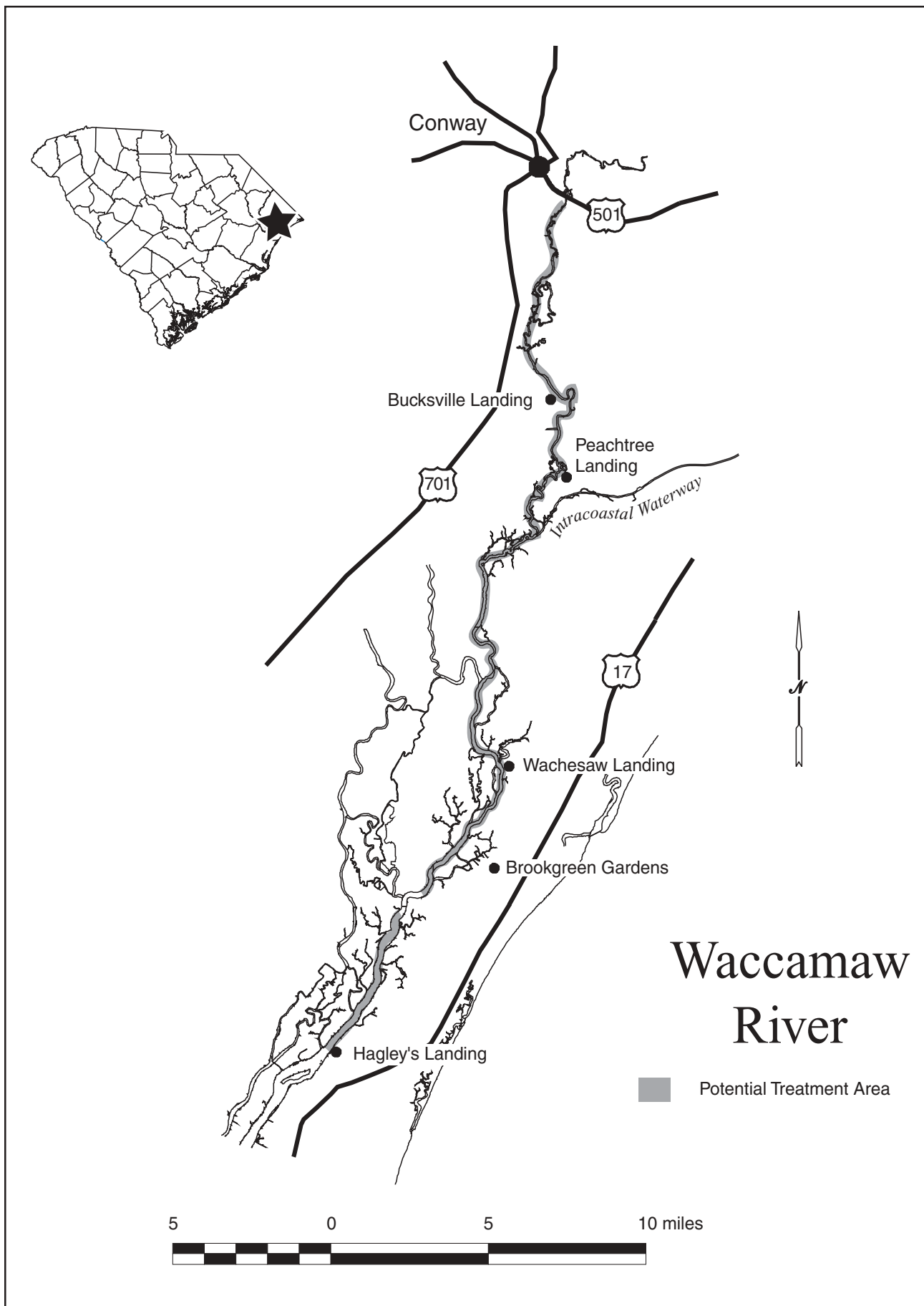
U.S. Army Corps of Engineers 40%

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



22. Yawkey Wildlife Center

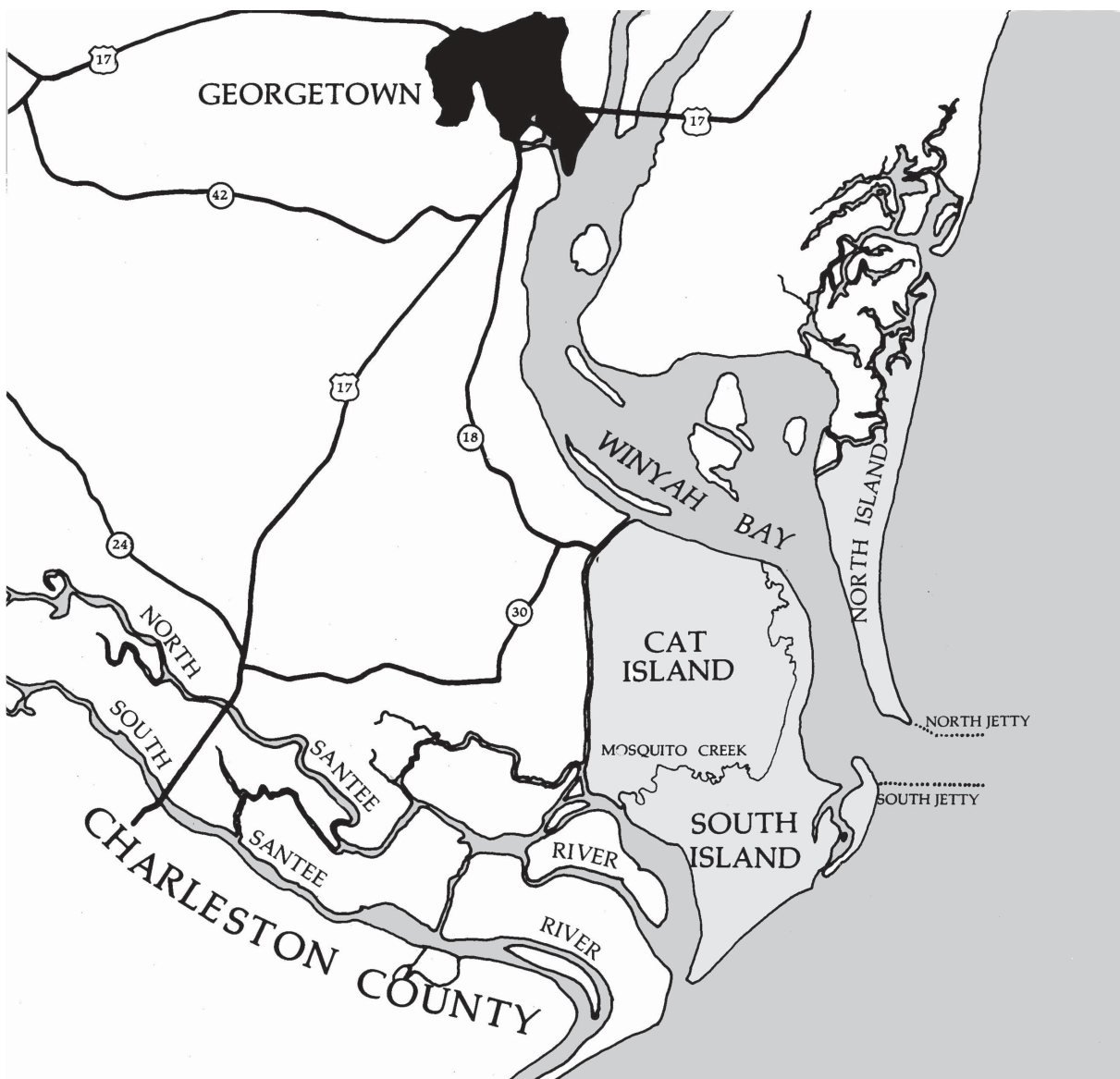
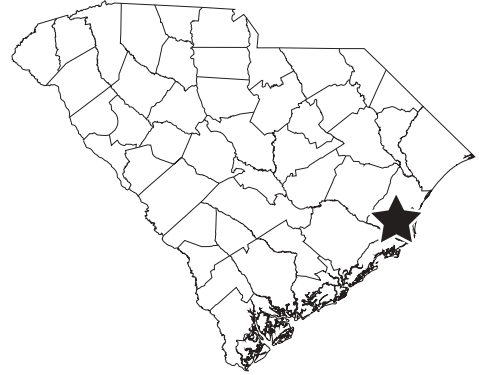
(Georgetown County)

1. Problem plant species
Phragmites
 2. Management objective
Reduce Phragmites populations to the greatest extent possible.
 3. Selected control method
Habitat/Glyphosate
 4. Area to which control is to be applied
50 acres of Phragmites throughout the ricefields.
 5. Rate of control agent to be applied
Habitat/Glyphosate - up to 4 pints per acre/up to 6 pints per acre.
 6. Method of application of control agent
Spray on surface of foliage with appropriate surfactant.
 7. Timing and sequence of control application
Habitat/Glyphosate - Apply when plants are actively growing.
 8. Other control application specifications
Application to be conducted by helicopter.
 9. Entity to apply control agent
Commercial applicator
 10. Estimated cost of control operations
\$12,472
 11. Potential sources of funding
Yawkey Foundation 70%
S. C. Department of Natural Resources 30%
- (Percentage of match subject to change based on availability of Federal and State funding.)*

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.

Yawkey Wildlife Center



23. Barnwell State Park (Swimming Lake)

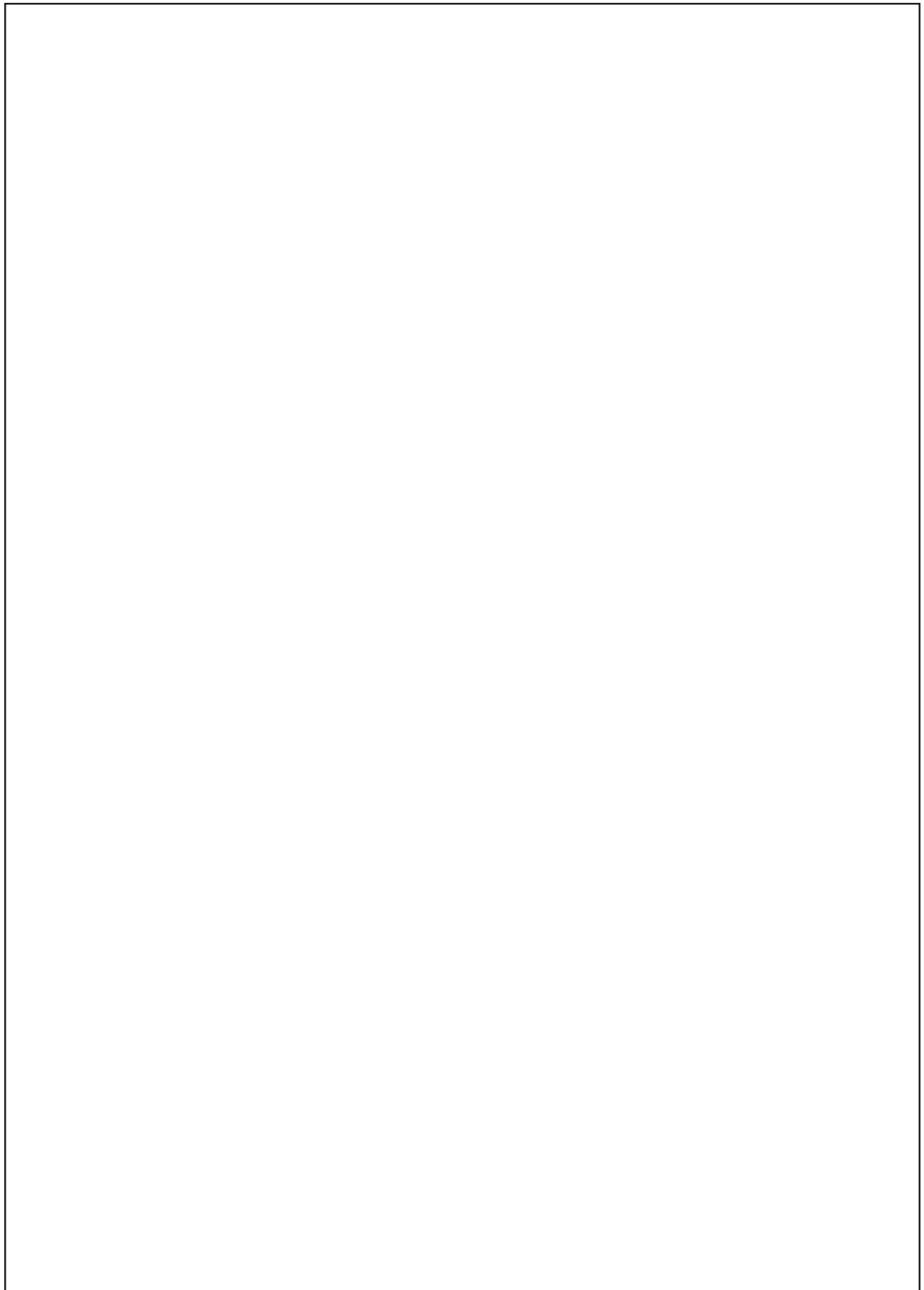
(Barnwell County)

1. Problem plant species
Waterlily
2. Management objective
Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method
2,4-D BEE granular
4. Area to which control is to be applied
3 acres in swimming lake.
5. Rate of control agent to be applied
200 lbs per acre
6. Method of application of control agent
Apply granular with spreader throughout lake
7. Timing and sequence of control application
Apply when plants are actively growing.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$2,400
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (70%)
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



24. Charles Towne Landing State Park

(Charleston County)

1. Problem plant species

Duckweed	Alligatorweed
Pennywort	
2. Management objective

Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method

<u>Problems species</u>	<u>Control Agent</u>
Duckweed	Fluridone
Alligator weed	Glyphosate
Pennywort	Glyphosate
4. Area to which control is to be applied

Fluridone - 3 acres
Glyphosate - 1 acre
5. Rate of control agents to be applied

Fluridone - 1 pint per acre
Glyphosate - 7.5 pints per acre
6. Method of application of control agents

Fluridone - Apply subsurface throughout lake
Glyphosate- Spray on surface of foliage with appropriate surfactant
7. Timing and sequence of control application.

Fluridone & glyphosate applied when plants are actively growing

8. Other control application specifications

None
9. Entity to apply control agent

Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations

\$1,400

11. Potential sources of funding

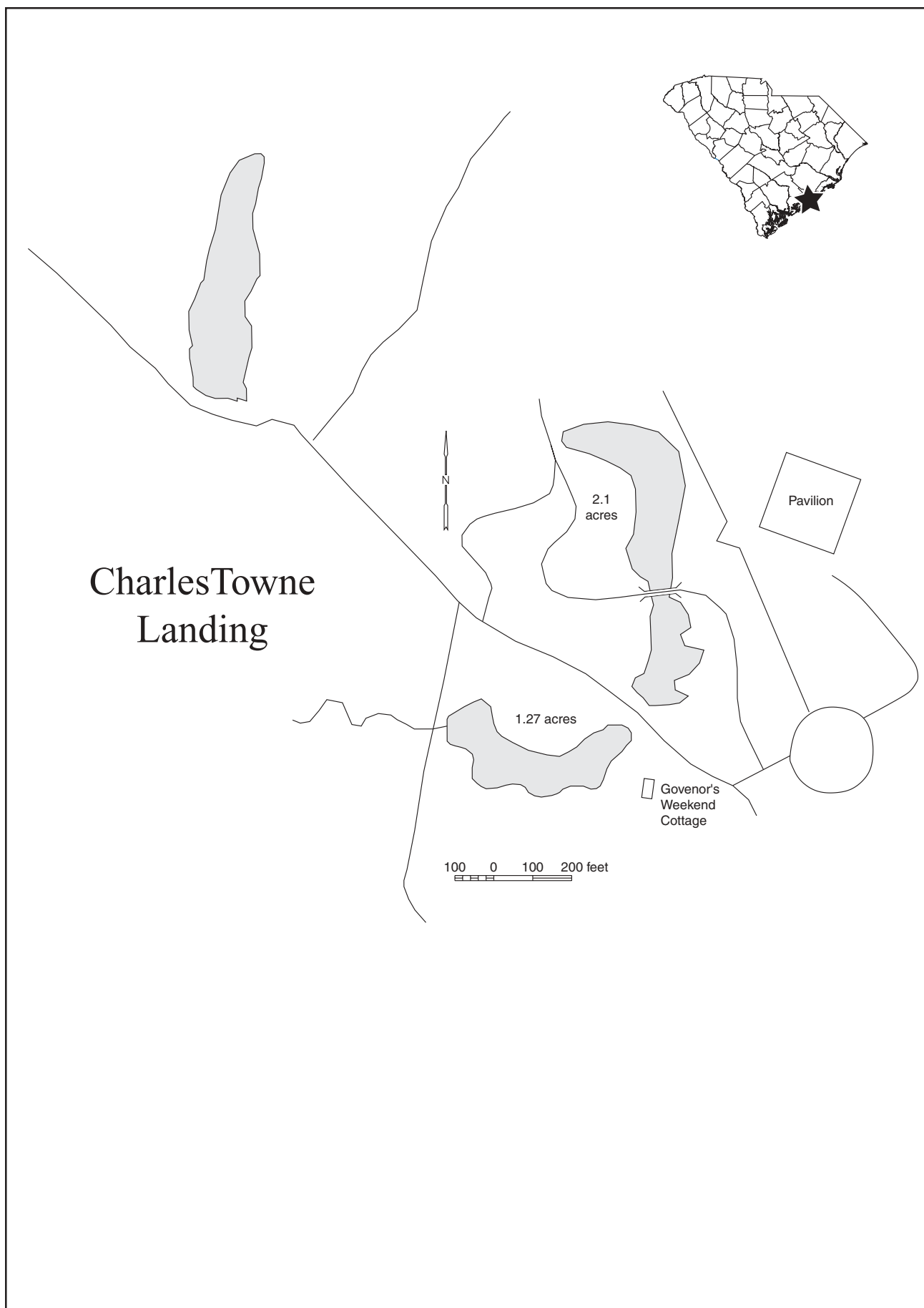
S.C. Department of Parks, Recreation and Tourism (70%)

S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



25. Kings Mountain State Park - Crawford Lake

(York County)

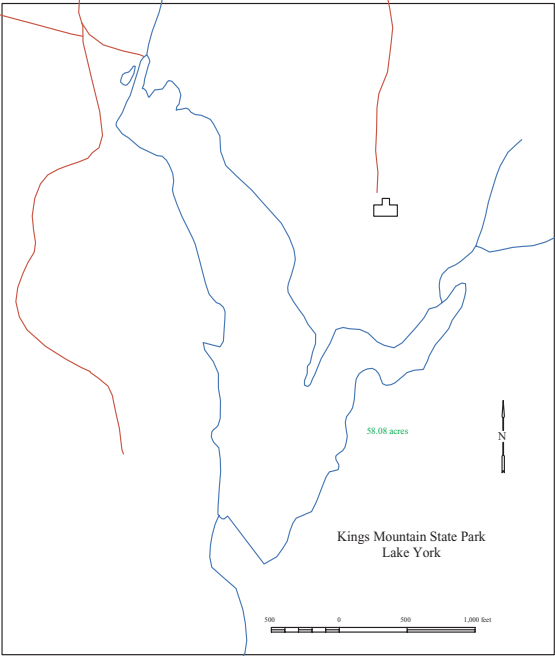
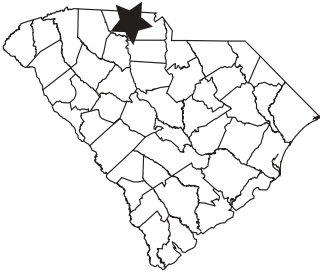
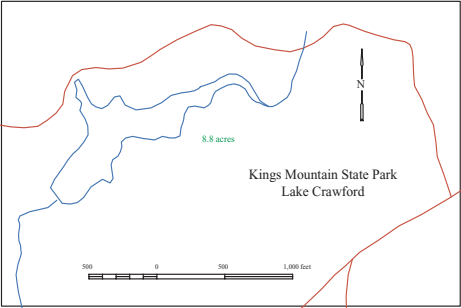
1. Problem plant species
Slender naiad
2. Management objective
Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method
Aquathol K
4. Area to which control is to be applied
4 acres in swimming and paddle boat area
5. Rate of control agent to be applied
Four gallons per acre.
6. Method of application of control agent
Apply subsurface throughout lake
7. Timing and sequence of control application
Apply in May or June when naiad growth is initiated.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$2,200
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (70%)
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Kings Mountain State Park



26. Little Pee Dee State Park

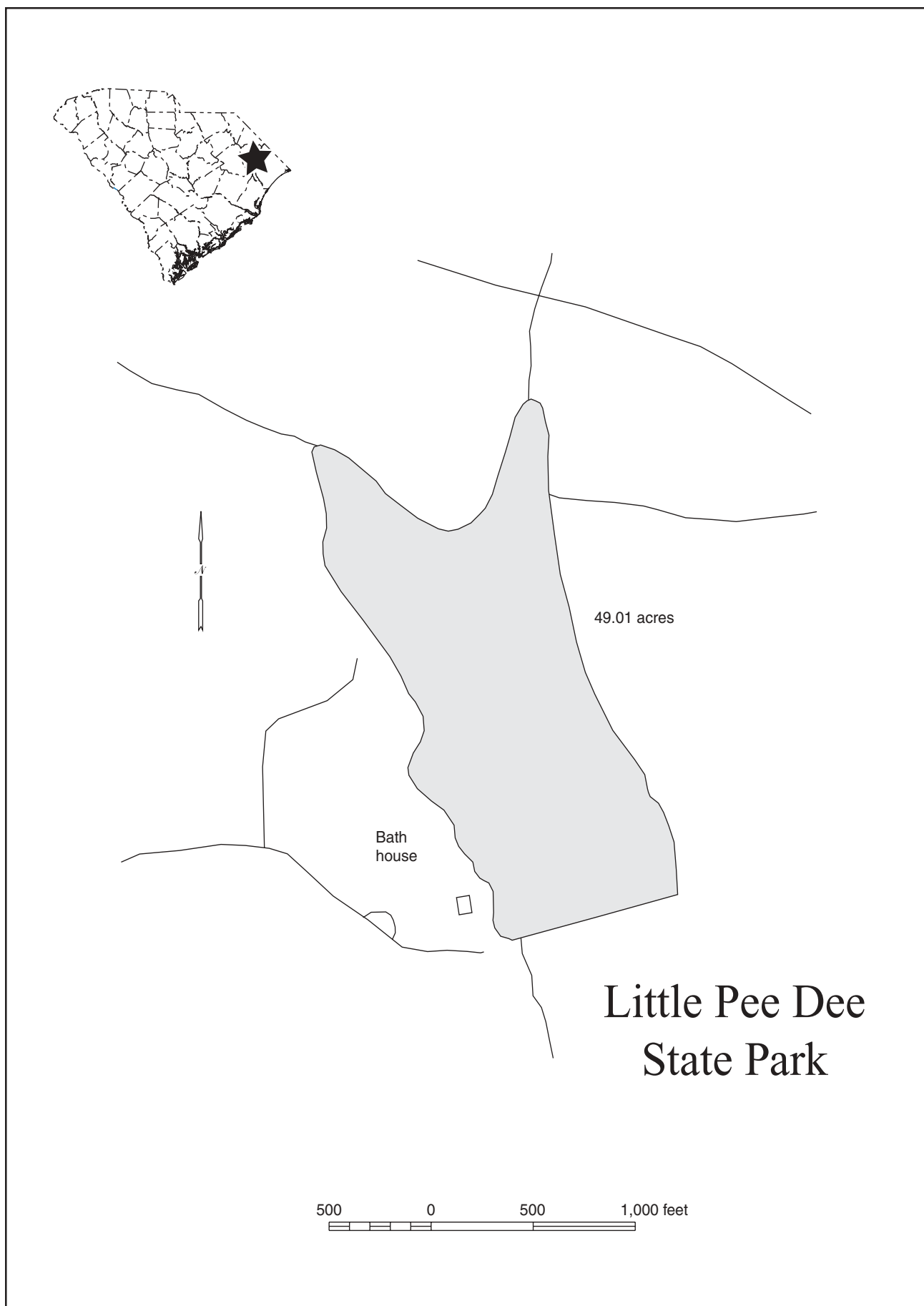
(Dillon County)

1. Problem plant species
 - Spikerush
 - Cowlily
2. Management objective
 - Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method
 - 2,4-D BEE granular
4. Area to which control is to be applied
 - 15 acres adjacent to the parks day use area, along the park dam and adjacent to the campground
5. Rate of control agent to be applied
 - 200 lbs per acre
6. Method of application of control agent
 - Apply granular with spreader throughout lake
7. Timing and sequence of control application
 - Apply when plants are actively growing.
8. Other control application specifications
 - Monitor plant growth prior to treatment.
9. Entity to apply control agent
 - Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
 - \$8,000
11. Potential sources of funding
 - S.C. Department of Parks, Recreation and Tourism (70%)
 - S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.



27. Santee State Park - Swimming Lake

(Orangeburg County)

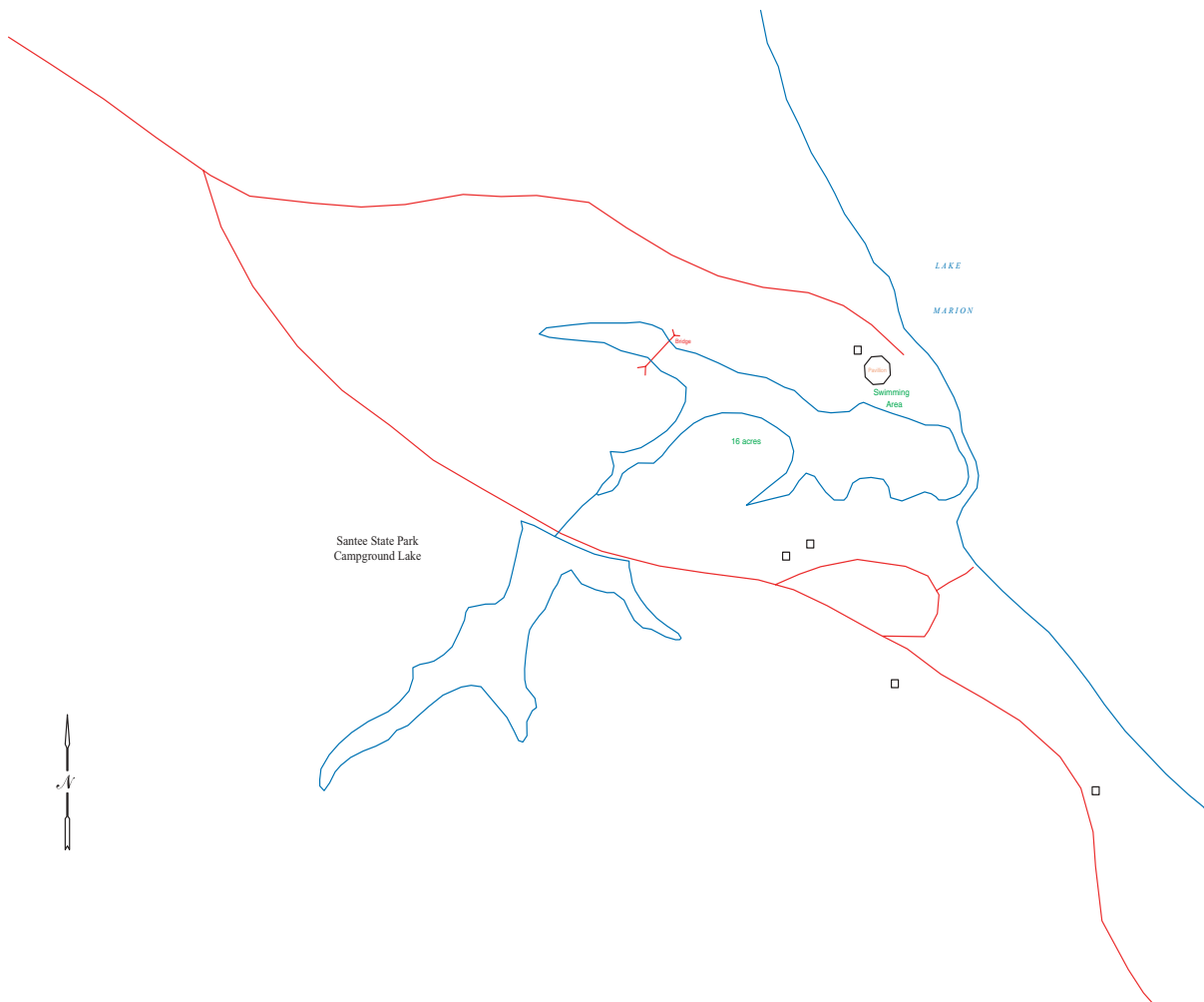
1. Problem plant species
Coontail
2. Management objective
Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method
Reward (Diquat)
4. Area to which control is to be applied
10 acres
5. Rate of control agent to be applied
2 gallons per acre
6. Method of application of control agent
Apply subsurface throughout lake
7. Timing and sequence of control application
Apply when plants are actively growing.
8. Other control application specifications
Monitor plant growth prior to treatment.
9. Entity to apply control agent
Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
\$1,500
11. Potential sources of funding
S.C. Department of Parks, Recreation and Tourism (70%)
S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Santee State Park



28. Sesquicentennial State Park

(Richland County)

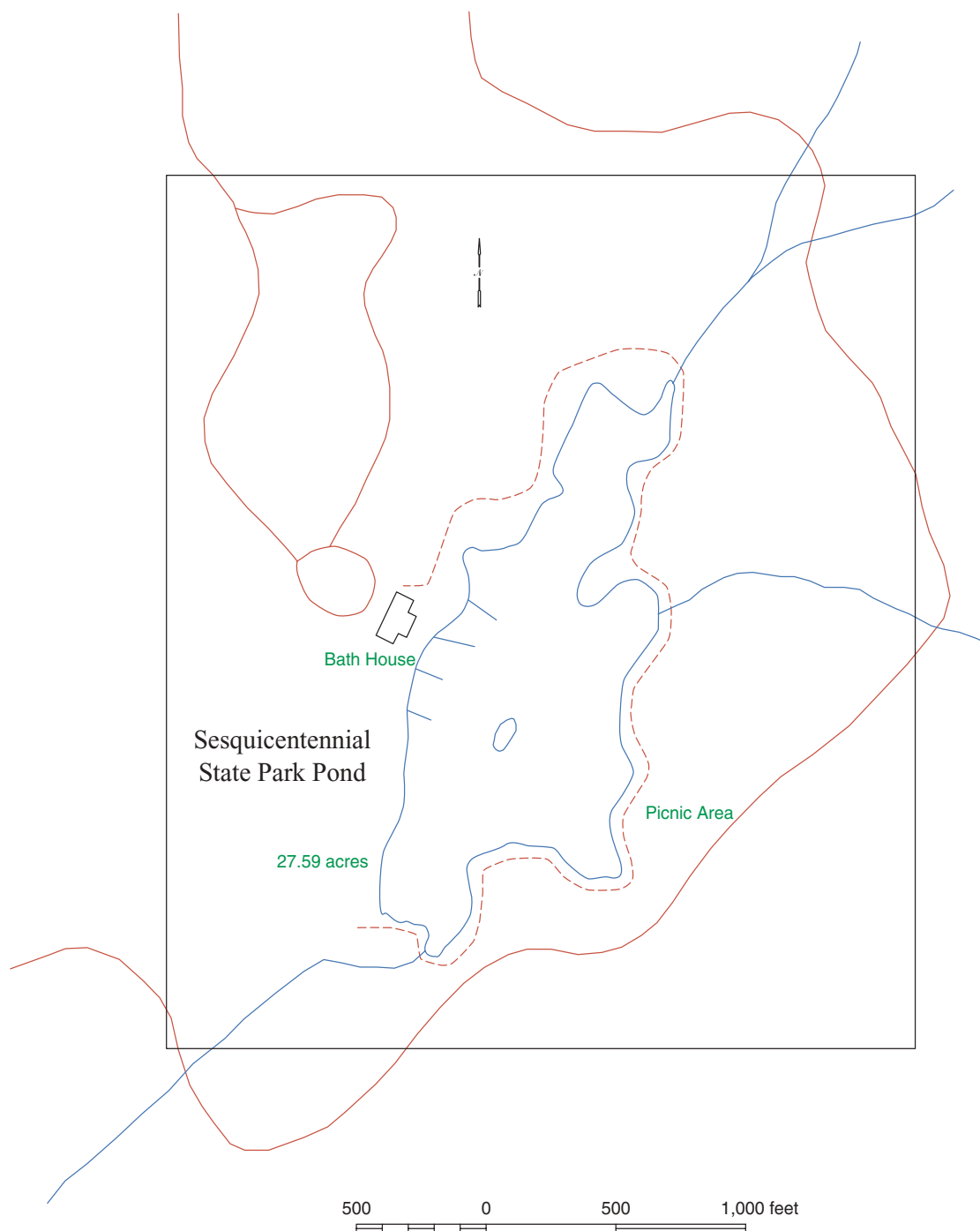
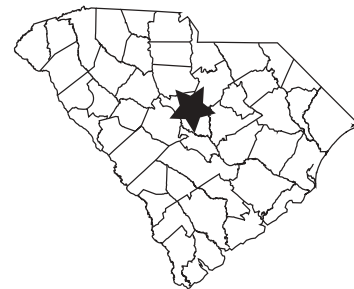
1. Problem plant species
 - Waterlily
 - Watershield
2. Management objective
 - Reduce or remove problem plants to the extent they do not interfere with recreational opportunities.
3. Selected control method
 - 2,4-d BEE granular
4. Area to which control is to be applied
 - 5 acres in swimming and bank fishing portions of the lake.
5. Rate of control agent to be applied
 - 200 lbs per acre
6. Method of application of control agent
 - Apply granular with spreader throughout lake
7. Timing and sequence of control application
 - Apply when plants are actively growing.
8. Other control application specifications
 - Monitor plant growth prior to treatment.
9. Entity to apply control agent
 - Commercial applicator contracted and monitored by SCPRT.
10. Estimated cost of control operations
 - \$4,000
11. Potential sources of funding
 - S.C. Department of Parks, Recreation and Tourism (70%)
 - S. C. Department of Natural Resources 30%

(Percentage of match subject to change based on availability of Federal and State funding.)

12. Long term management strategy

- a. Manage the distribution and abundance of nuisance aquatic plant populations at levels that minimize adverse impacts to water use activities and the environment through the use of federal and state approved control methods.
- b. Maintain or enhance native aquatic plant populations at levels beneficial to water use, water quality, and fish and wildlife populations through selective control of nuisance plant populations where feasible, introduction of native plant species where appropriate, and public education of the benefits of aquatic vegetation in general.
- c. Seek to prevent further introduction and distribution of problem species through public education, posting signs at boat ramps, regular surveys of the water body, and enforcement of existing laws and regulations.

Sesquicentennial State Park



Summary of Planned Management Operation Expenditures For 2005

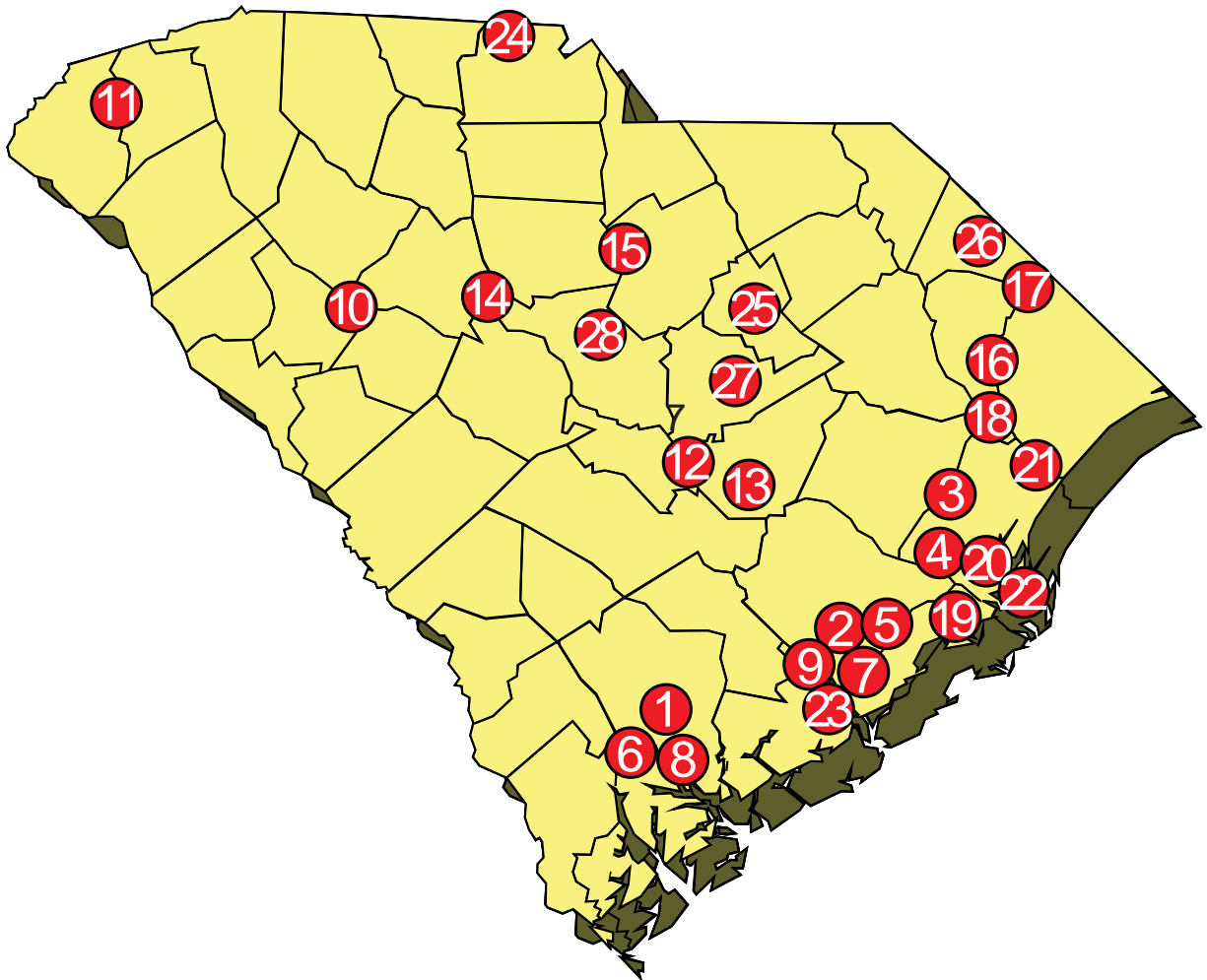
Water Body	Total Cost	Federal	State	Local	Local Sponsor
1. Ashepoo	\$437	\$175	\$131	\$131	Colleton Co.
2. Back River Reservoir	\$121,966	\$48,786	\$36,590	\$36,590	SCE&G, CPW
3. Black Mingo Creek	\$3,790	\$1,516	\$1,137	\$1,137	Georgetown Co.
4. Black River	\$3,790	\$1,516	\$1,137	\$1,137	Georgetown Co.
5. Bonneau Ferry	\$20,326	\$0	\$20,326	\$0	SCDNR
6. Combahee River (Borrow Pit)	\$1,712	\$685	\$513	\$513	Colleton Co.
7. Cooper River	\$83,957	\$33,583	\$25,187	\$25,187	Berkeley Co.
8. Donnelley/Bear Island WMA	\$7,483	\$0	\$2,245	\$5,238	SCDNR, UFWS
9. Goose Creek Reservoir	\$28,010	\$11,204	\$8,403	\$8,403	Charleston CPW
10. Lake Greenwood	\$21,624	\$8,650	\$6,487	\$6,487	Greenwood Co.
11. Lake Keowee	\$2,279	\$912	\$684	\$684	Duke Power
12. Lake Marion	\$125,000	\$50,000	\$37,500	\$37,500	Santee Cooper
13. Lake Moultrie	\$15,000	\$6,000	\$4,500	\$4,500	Santee Cooper
14. Lake Murray	\$0	\$0	\$0	\$0	SCE&G, Lexington Co., Richland Co.
15. Lake Wateree	\$2,552	\$1,021	\$766	\$766	Duke Power
16. Little Pee Dee River	\$7,132	\$2,853	\$2,139	\$2,139	Horry Co.
17. Lumber River	\$2,853	\$1,141	\$856	\$856	Horry Co.
18. Pee Dee River	\$9,242	\$3,697	\$2,773	\$2,773	Georgetown Co.
19. Santee Coastal Reserve	\$62,358	\$0	\$18,707	\$43,650	SCDNR
20. Santee Delta WMA	\$7,483	\$0	\$2,245	\$5,238	SCDNR
21. Waccamaw River	\$6,555	\$2,622	\$1,967	\$1,967	Horry Co.
22. Yawkey Wildlife Center	\$12,472	\$0	\$3,741	\$8,730	Yawkey Foundation
23. Barnwell SP	\$2,400	\$0	\$720	\$1,680	SCPRT
24. Charlestown Landing SP	\$1,400	\$0	\$420	\$980	SCPRT
25. Kings Mt. Lk. Crawford SP	\$2,200	\$0	\$660	\$1,540	SCPRT
26. Little Pee Dee SP	\$8,000	\$0	\$2,400	\$5,600	SCPRT
27. Santee SP (swimming lake)	\$1,500	\$0	\$450	\$1,050	SCPRT
28. Sesquicentennial SP	\$4,000	\$0	\$1,200	\$2,800	SCPRT
Totals:	\$565,519	\$174,359	\$183,884	\$207,276	

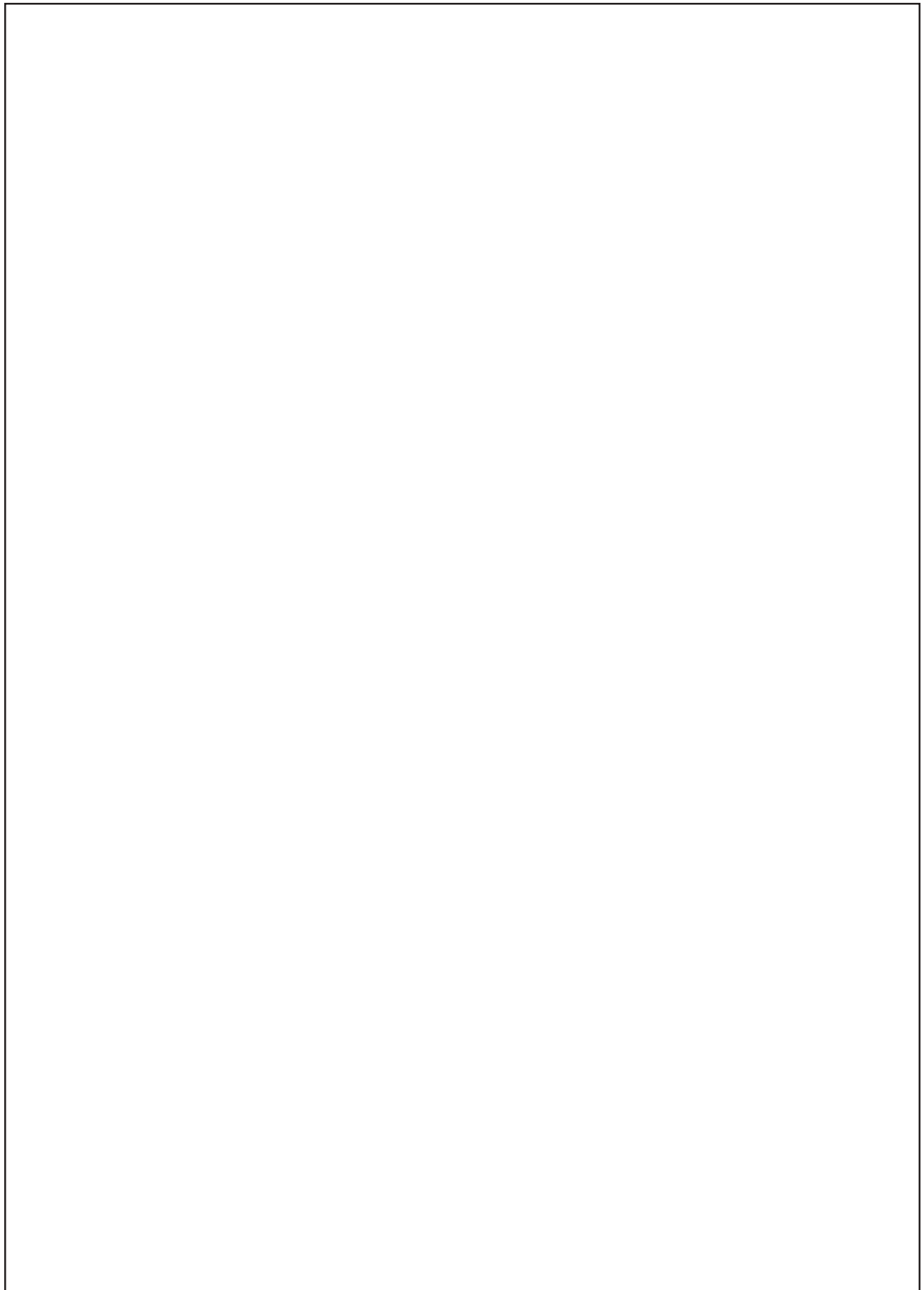
NOTE: Planned expenditures are based on anticipated aquatic plant problems. The extent of proposed management operations will be modified depending on actual aquatic plant growth and funding availability in 2005. *(Percentage of match subject to change based on availability of Federal and State funding.)*

* Control operations on Lakes Marion and Moultrie may receive federal funds from the Corps of Engineers St. Stephen Plant if control activities are directly related to maintaining operation of the St. Stephen Hydropower Facility. Those funds should be used whenever possible instead of APC cost-share funds from the Charleston District.

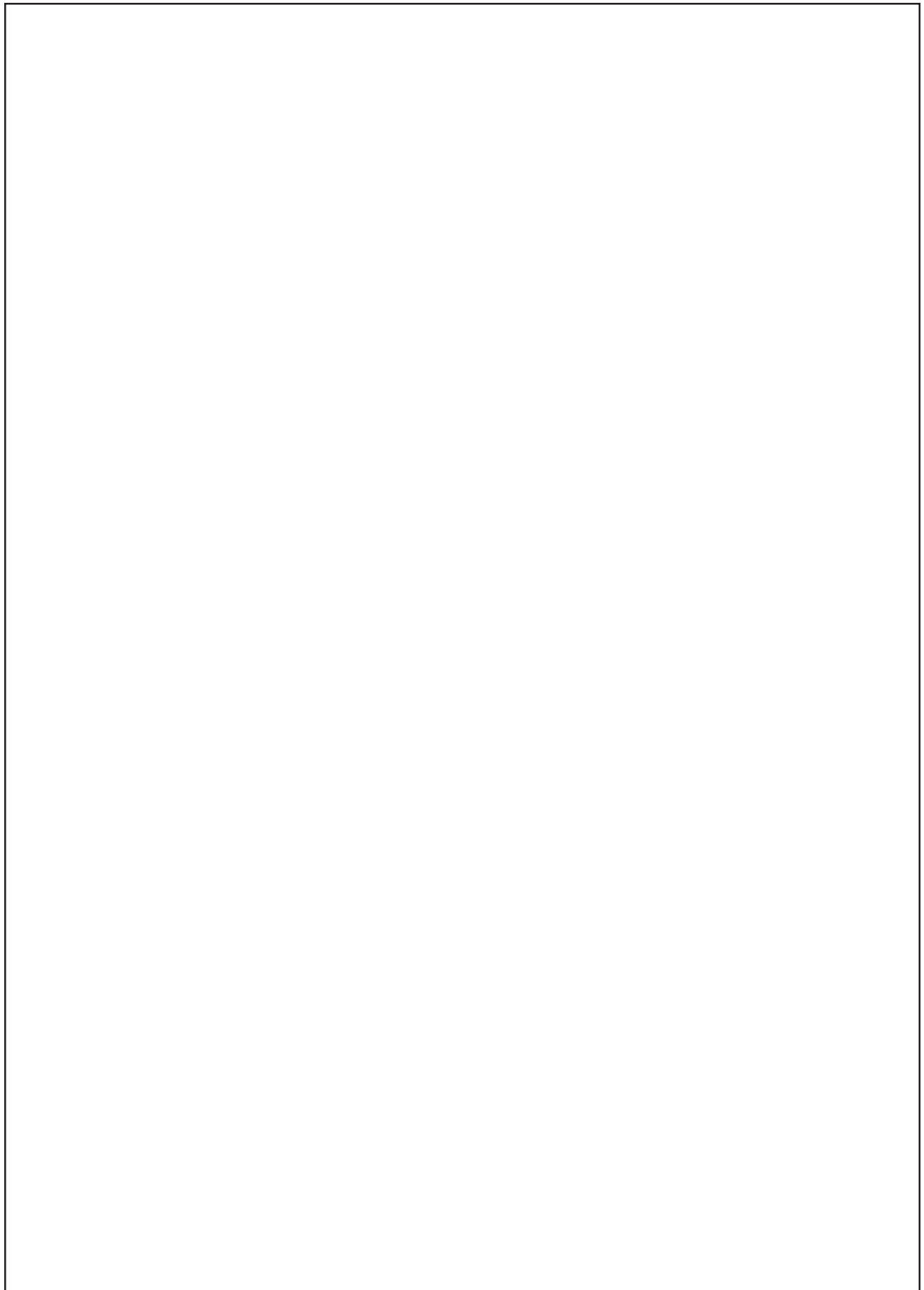
** State appropriated funds may be used for operations after July 1 if received in FY 05.

Location of 2005 Management Sites





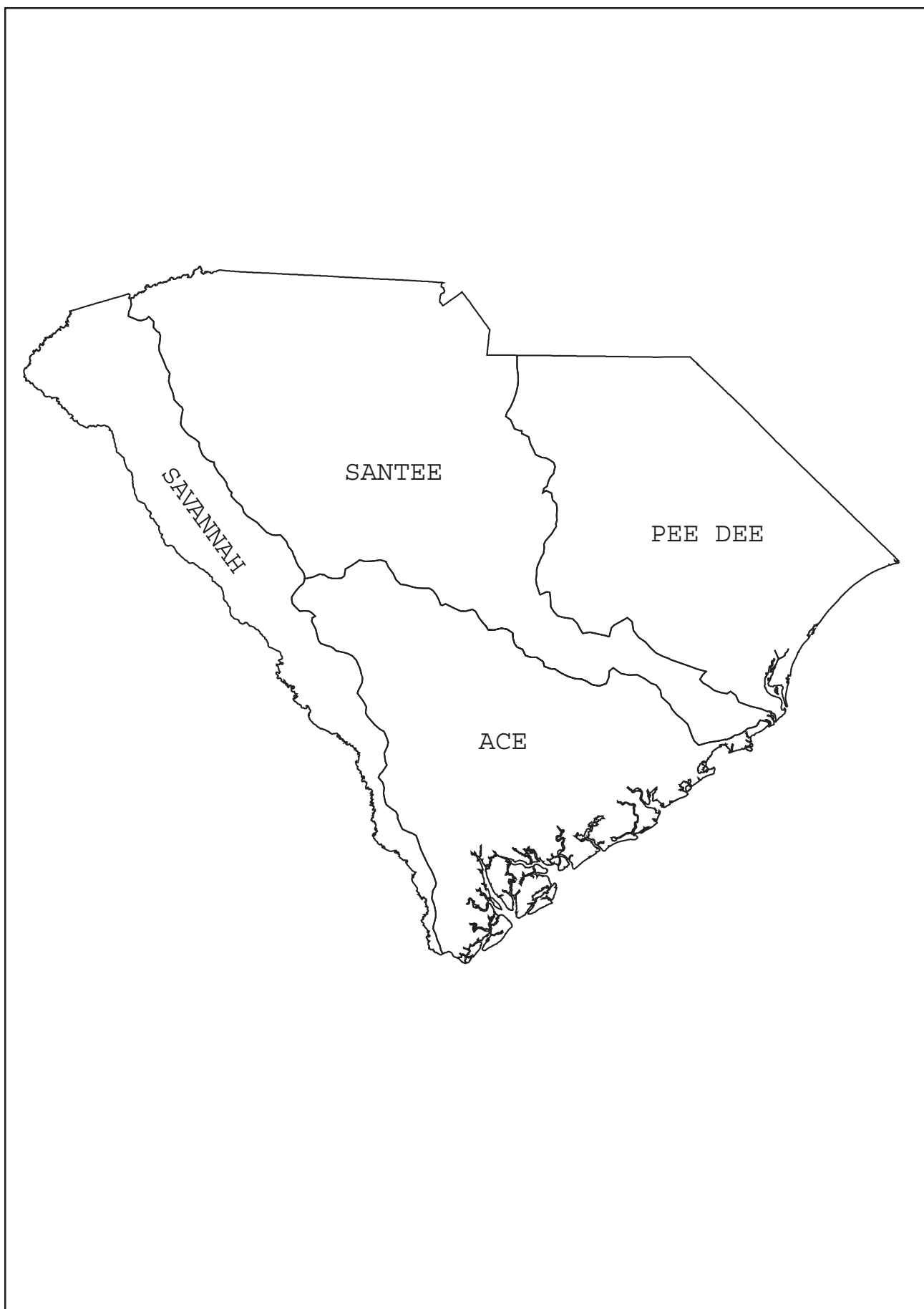
Appendices



APPENDIX A

Major River Basins

in South Carolina



APPENDIX B

Enabling Legislation

South Carolina Code of Laws Section 49-6-10/40

Title 49 – Waters, Water Resources and Drainage

CHAPTER 6. AQUATIC PLANT MANAGEMENT

SECTION 49-6-10. Purpose; administering agency.

There is hereby created the South Carolina Aquatic Plant Management Program for the purpose of preventing, identifying, investigating, managing, and monitoring aquatic plant problems in public waters of South Carolina. The program will coordinate the receipt and distribution of available federal, state, and local funds for aquatic plant management activities and research in public waters.

The Department of Natural Resources (department) is designated as the state agency to administer the Aquatic Plant Management Program and to apply for and receive grants and loans from the federal government or such other public and private sources as may be available for the Aquatic Plant Management Program and to coordinate the expenditure of such funds.

SECTION 49-6-20. Aquatic Plant Management Trust Fund.

There is created the South Carolina Aquatic Plant Management Trust Fund which must be kept separate from other funds of the State. The fund must be administered by the department for the purpose of receiving and expending funds for the prevention, management, and research of aquatic plant problems in public waters of South Carolina. Unexpended balances, including interest derived from the fund, must be carried forward each year and used for the purposes specified above. The fund shall be subject to annual audit by the Office of the State Auditor.

The fund is eligible to receive appropriations of state general funds, federal funds, local government funds, and funds from private entities including donations, grants, loans, gifts, bond issues, receipts, securities, and other monetary instruments of value. All reimbursements for monies expended from this fund must be deposited in this fund.

SECTION 49-6-30. Aquatic Plant Management Council; membership; duties.

There is hereby established the South Carolina Aquatic Plant Management Council, hereinafter referred to as the council, which shall be composed of ten members as follows:

1. The council shall include one representative from each of the following agencies, to be appointed by the chief executive officer of each agency:

- (a) Water Resources Division of the Department of Natural Resources;
- (b) South Carolina Department of Health and Environmental Control;
- (c) Wildlife and Freshwater Fish Division of the Department of Natural Resources;
- (d) South Carolina Department of Agriculture;
- (e) Coastal Division of the Department of Health and Environmental Control;
- (f) South Carolina Public Service Authority;
- (g) Land Resources and Conservation Districts Division of the Department of Natural Resources;
- (h) South Carolina Department of Parks, Recreation and Tourism;
- (i) Clemson University, Department of Fertilizer and Pesticide Control.

2. The council shall include one representative from the Governor's Office, to be appointed by the Governor.

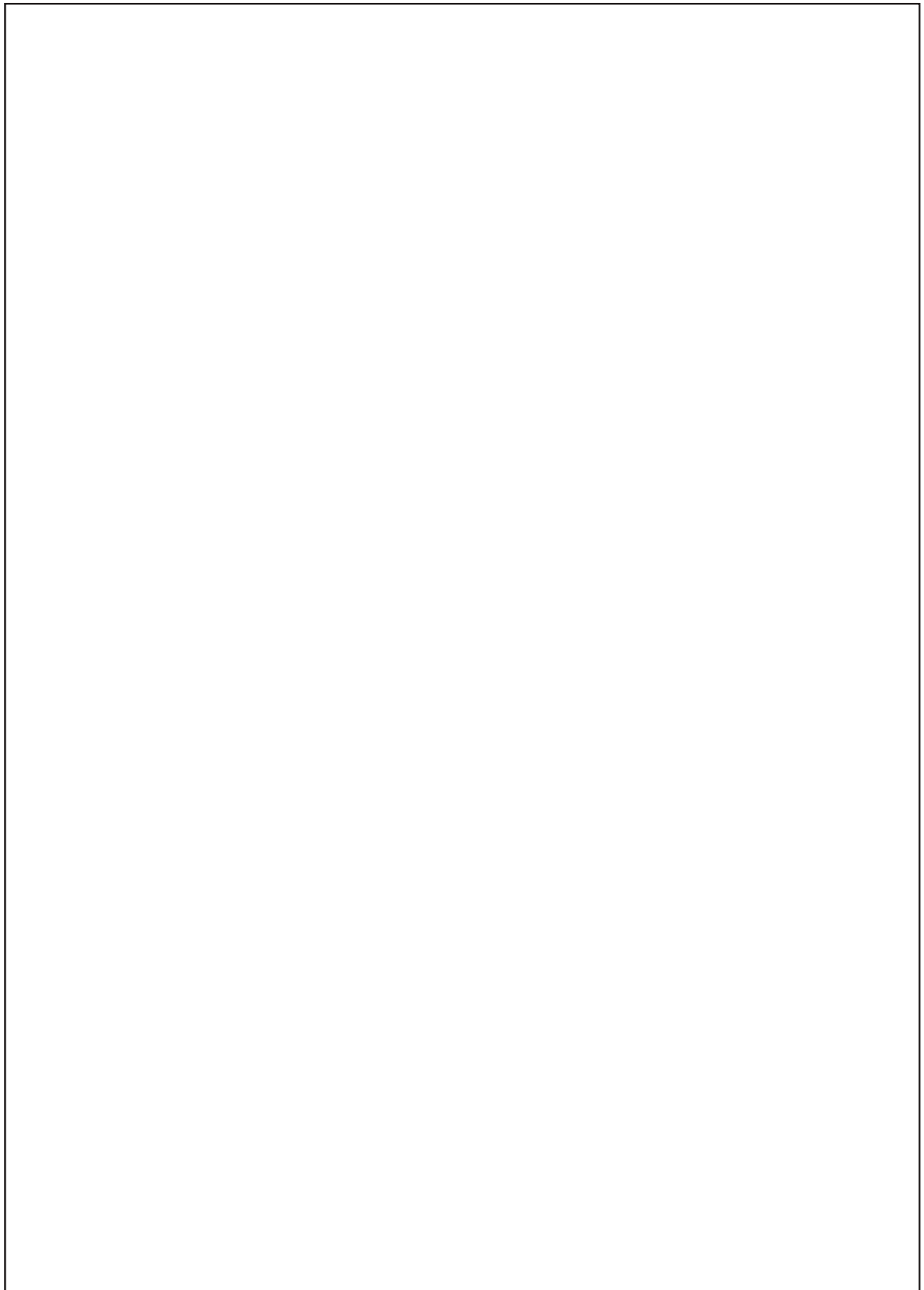
3. The representative of the Water Resources Division of the Department of Natural Resources shall serve as chairman of the council and shall be a voting member of the council.

The council shall provide interagency coordination and serve as the principal advisory body to the department on all aspects of aquatic plant management and research. The council shall establish management policies, approve all management plans, and advise the department on research priorities.

SECTION 49-6-40. Aquatic Plant Management Plan.

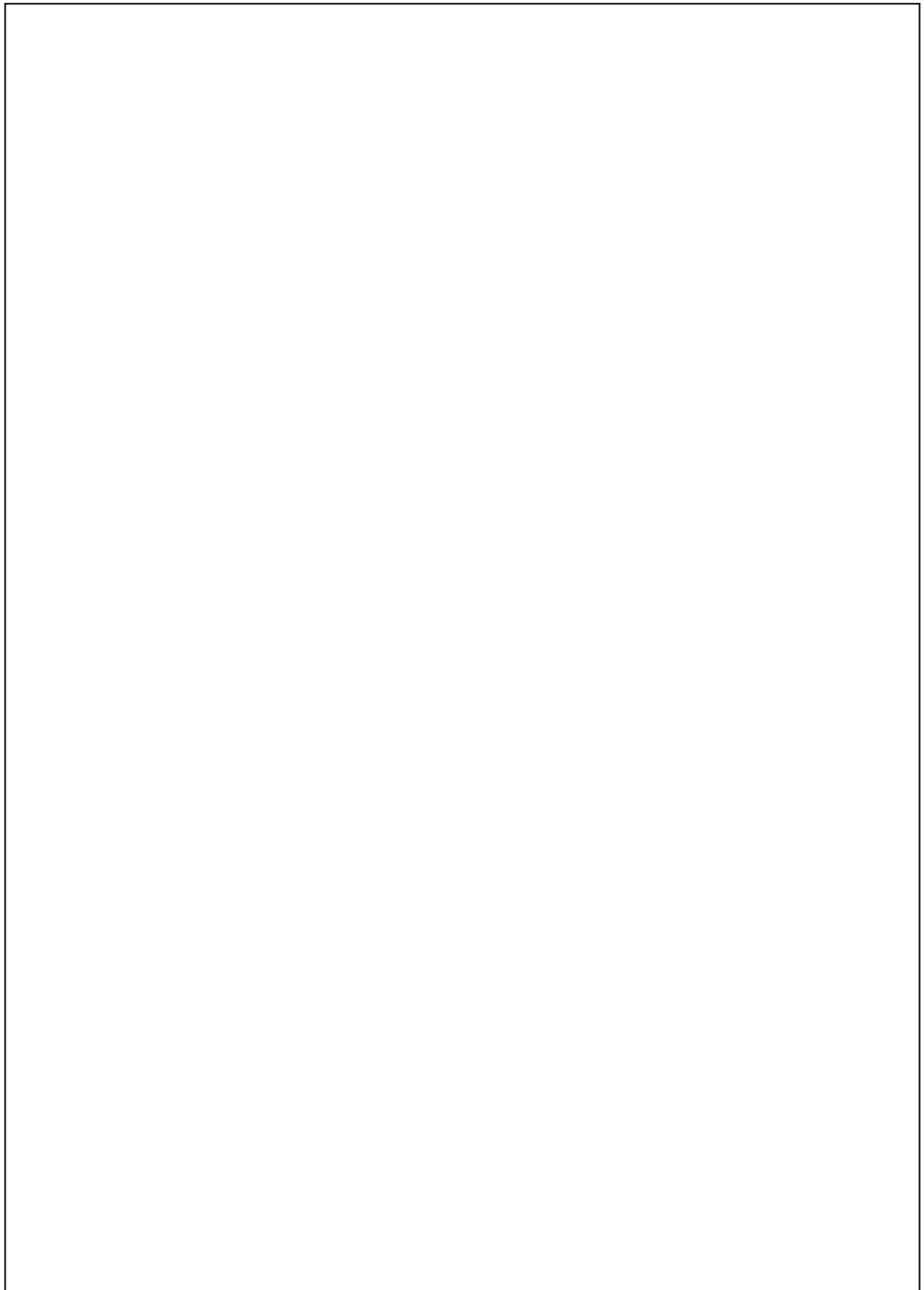
The department, with advice and assistance from the council, shall develop an Aquatic Plant Management Plan for the State of South Carolina. The plan shall describe the procedures for problem site identification and analysis, selection of control methods, operational program development, and implementation of operational strategies. The plan shall also identify problem areas, prescribe management practices, and set management priorities. The plan shall be updated and amended at appropriate intervals as necessary; provided, however, problem site identification and allocation of funding shall be conducted annually. In addition, the department shall establish procedures for public input into the plan and its amendments and priorities. The public review procedures shall be an integral part of the plan development process. When deemed appropriate, the department may seek the advice and counsel of persons and organizations from the private, public, or academic sectors.

The council shall review and approve all plans and amendments. Approval shall consist of a two-thirds vote of the members present. The department shall have final approval authority over those sections which do not receive two-thirds approval of the council.



APPENDIX C

Aquatic Plant Problem Identification Form



Aquatic Plant Problem Site Identification

1. Name and location of affected water body _____

2. Public or private water _____

3. Name of problem plant (if known) _____

4. Does the plant grow above or below the surface of the water? _____

5. Approximate area of water covered by the problem plant _____

6. Type of water use(s) affected by the plant _____

7. Length of time problem has existed _____

8. Plant control methods that have been used _____

9. Contact for additional information:

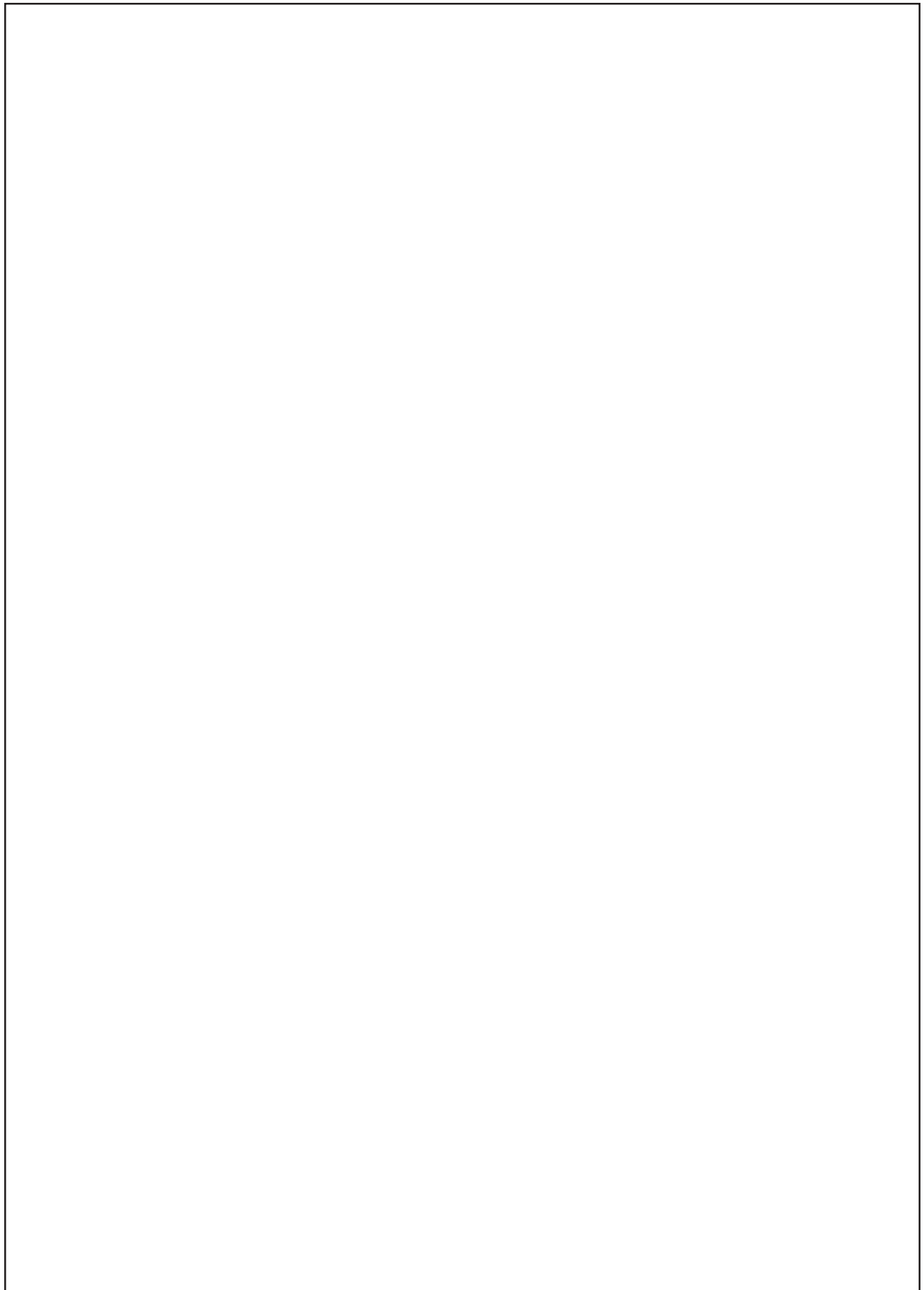
Name _____

Address _____

Phone _____

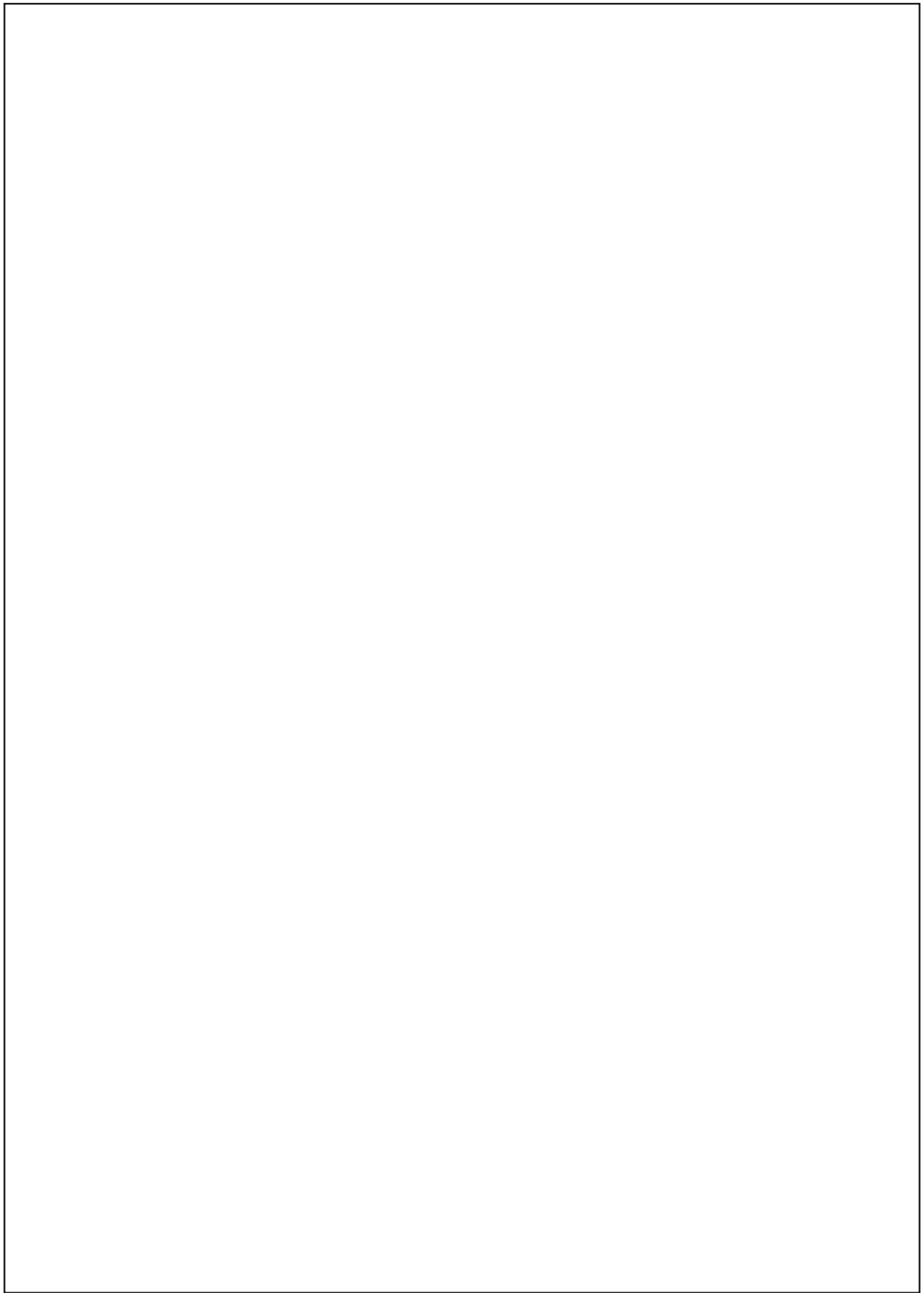
Please Return To: Chris Page
S.C. Department of Natural Resources
2730 Fish Hatchery Road
West Columbia, South Carolina 29172
(803) 755-2836

Please include a sample of the plant if possible. Wrap the plant in a moist towel and place in a "baggie". The sample should include flowers, if visible, along with leaf structure and stem.



APPENDIX D

Aquatic Plant Control Agents



Aquatic Plant Control Agents

Listed below are the major aquatic plant control agents which are currently available for use in South Carolina. While the list is not all inclusive, it does contain those agents considered most useful for aquatic plant management. Costs for the agents are approximations and will vary somewhat depending on the source and amount purchased. Application costs are approximations of commercial applicator rates.

I. Chemical Control

A. Diquat (Reward)

1. Target Plants
 - a. Submersed species - Bladderwort, coontail, elodea, naiad, pondweeds, watermilfoil, and hydrilla.
 - b. Floating species - Pennywort, Salvinia, water hyacinth, water lettuce, and duckweed.
2. Application Rate
 - a. Submersed species - One to two gallons per surface acre.
 - b. Floating species - One half to one gallon per surface acre, depending on target species.
3. Cost -Diquat costs approximately \$93 per gallon. Assuming an application rate of two gallons per acre and an application cost of \$39 per acre, the total cost would be \$225 per acre per application for submersed species. The treatment cost for floating species at one-half gallon per acre rate would be \$86 per acre.
4. Use Considerations -Diquat is not toxic to fish or wildlife at normal use concentrations. It is non-volatile and nonflammable, but can cause irritation to eyes and skin upon contact. Its effectiveness is greatly reduced at temperatures below 50-60°F, by overcast conditions, and by turbid waters.
5. Water Use Restrictions - Water treated with Diquat cannot be used for drinking for up to 3 days, livestock consumption for one day, irrigation of food crops for 5 days, and irrigation of turf and ornamentals for up to 3 days depending on application rate or until approved analysis indicates that diquat ion concentrations are less than 0.02 ppm. There are no fishing or swimming restrictions. Do not apply this product within 1600 feet upstream of an operating water intake in flowing water bodies (rivers, streams, canals) or within 400 feet of an operating water intake in standing water bodies (lakes, reservoirs). To make applications within these restricted areas, the intake must be turned off for the time periods

specified on the Federal label for the appropriate use category (Drinking, Livestock consumption, Irrigation) or until the treated area contains less than 0.02 ppm of diquat dibromide.

B. 2,4-D (Aqua-Kleen, Navigate)

1. Target Plants

- a. Emergent species - Broadleaf species such as water primrose, waterlily, cowlily, watershield, smartweed, pondweeds, and floating heart.
- b. Submersed species - Watermilfoil, bladderwort, and coontail.
- c. Floating species - Water hyacinth.

2. Application Rate

- a. Granular form (2,4-D BEE) - 150 to 200 pounds per acre depending on target species.
- b. Liquid form - (2,4-D DMA) - 4 3/4 pints in 50 to 100 gallons of water per acre.

3. Cost

- a. The granular form of 2,4-D costs about \$2.07 per pound. Assuming an application rate of 150 pounds per acre and an application cost of \$55 per acre, the total cost would be \$365 per application.
- b. The liquid form of 2,4-D costs approximately \$11.50 per gallon. Assuming an application rate of 4 3/4 pints per acre and an application cost of \$39 per acre, the total cost would be \$46 per

4. Use Considerations - The recommended formulations of 2,4-D are not toxic to fish or wildlife at normal use concentrations. This chemical is nonflammable and noncorrosive.

5. Water use Restrictions - Do not apply to waters used for irrigation, agricultural sprays, watering dairy animals, or domestic water supplies.

C. Chelated Copper (Cutrine Plus, Clearigate, Komeen, K-TEA, Nautique, Captain)

1. Target Plants

- a. Algae - Cutrine Plus, K-TEA, Captain
- b. Submersed species (Hydrilla, Brazilian elodea, pondweed and southern naiad) - Komeen, Nautique, Cutrine Plus, Clearigate, and Captain

2. Application Rate
 - a. Algae - Treatment concentration of 0.2-0.5 parts per million of copper.
 - b. Submersed species - 1.0 part per million of copper (12-16 gallons per acre) or mix two gallons of copper complex and two gallons of diquat per acre.
 3. Cost - Copper products cost about \$11.50 per gallon. Assuming an application rate of 16 gallons per acre and an application cost of \$39 per acre, the total cost would be \$223 per acre.
 4. Use Considerations - Copper may be toxic to fish and aquatic invertebrates at recommended application rates, especially in soft water. Copper-based product should be carefully applied and monitored to minimize the risk of fish kills.
 5. Water Use Restrictions - Copper complexes may be used in domestic and irrigation water supplies without water use restrictions.
- D. Endothall - (Aquathol, Aquathol K, Aquathol Super K granular, Hydrothol 191 granular and liquid)

1. Target Plants

Aquathol products are effective for submersed species such as naiads, bladderwort, coontail, watermilfoil, pondweed, hydrilla, and cabomba.

Hydrothol 191 is effective on the species listed above as well as filamentous and macrophytic algae.

2. Application Rate

Aquathol

- a. Liquid form (Aquathol K) - three gallons or more per acre depending on the target species.
- b. Granular form - Aquathol: 54-323 pounds per acre depending on water depth and the target species.

Aquathol Super K: 22-66 pounds per acre depending on the water depth and the target species.

Hydrothol 191

- a. Heavy Infestations - Evenly spread 160 - 270 pounds per acre foot of water (3.0 - 5.0 ppm) applied evenly.
- b. Moderate or light infestations - Use 55 - 110 pounds per acre foot (1.0 - 2.0 ppm) applied evenly.

3. Cost

Aquathol

- a. Aquathol K costs approximately \$47 per gallon. Assuming an application rate of 5 gallons per acre and an application cost of \$39 per acre, the total cost would be \$274 per acre.
- b. Aquathol granular costs about \$2.25 per pound. At an application rate of 150 pounds per acre and an application cost of \$55 per acre, the total cost would be \$393 per acre per application.
- c. Aquathol Super K costs about \$13.00 per pound at an application rate of 30 pounds per acre and an application cost of \$55 per acre, the total cost would be \$445 per acre.

Hydrothol 191

Hydrothol 191 granular costs approximately \$2.25 per pound. Assuming an application rate of 240 pounds per acre and an application cost of \$55, the total cost would be \$595 per acre.

4. Use Considerations - Concentrated endothall formulations are toxic to man if ingested or absorbed through the skin. They are also irritating to the skin and eyes. Avoid contact with or drift to other crops or plants as injury may result. Generally not toxic to fish at normal use concentrations, however, fish may be killed by dosages of Hydrothol 191 in excess of 0.3 ppm.
5. Water Use Restrictions - Water treated with endothall cannot be used for watering livestock, preparing agricultural sprays for food crops, for irrigation or domestic purposes for 7 to 25 days after treatment (depending on treatment concentration) or until such time that the water does not contain more than 0.2 ppm of endothall. Do not use fish from treated areas for feed or food for three days after treatment.

E. Glyphosate (Rodeo, Eagle, Aquastar)

1. Target Plants - Emergent broadleaf plants and grasses such as alligatorweed, water primrose, smartweed, and *Phragmites*.
2. Application Rate - Up to 7 1/2 pints per acre, the specific rate depending on the target species.
3. Cost - Glyphosate products range in price from \$47-\$77 per gallon. At an application rate of 7.5 pints per acre and an application cost of \$39 per acre, the total would range from \$83-\$111 per acre per application.

4. Use Considerations - Glyphosate is not toxic to mammals, birds or fish at recommended use concentrations. Glyphosate products with aquatic labels can be used in and around aquatic sites, including all bodies of fresh and brackish water which may be flowing or nonflowing.
5. Water Use Restrictions - Do not apply within 0.5 miles upstream of potable water intakes unless water intake is shut off for 48 hours. There are no restrictions on water use for irrigation or recreation after treatment.

F. Fluridone (Sonar, Avast)

1. Target Plants - Primarily submersed plants, such as hydrilla, Brazilian elodea, watermilfoil, pondweeds, duckweeds and naiads; also effective on lilies and some grasses.
2. Application Rate
 - a. Liquid form (Sonar AS, Avast) - 0.12 to 2.44 quarts per acre depending on water depth.
 - b. Pellet forms (Sonar PR, Sonar SRP, Avast SRG) - 15 to 80 pounds per acre depending on water depth.
3. Cost
 - a. The liquid formulation ranges from \$1200-\$1500 per gallon. Assuming an application rate of 2 quarts per acre (2 pounds active ingredient per acre) and an application cost of \$39 per acre, the total cost would be \$639 per acre per application.
 - b. The pellet formulations range in price from \$21.00-\$25.00 per pound. Assuming an application rate of 40 pounds per acre (2 pounds active ingredient per acre) and an application cost of \$55 per acre, the total cost would be \$895 per acre per application.
4. Use Considerations - In large lakes and reservoirs fluridone should be applied to areas greater than five acres. This herbicide requires a long contact time and is not effective in sites with significant water movement or rapid dilution. Fluridone is slow acting and may require 30 to 90 days to achieve desired control under optimal conditions. Unlike other aquatic herbicides, fluridone has proven effective in inhibiting viable hydrilla tuber production.
5. Water Use Restrictions - Do not apply within 1/4 mile of a functioning potable water intake unless concentrations are less than 20 ppb. Water treated with fluridone cannot be used for irrigation for 7-30 days depending on target crop.

G. Imazapyr (Habitat)

1. Target Plants - Phragmites, Alligatorweed, Water primrose, and Cutgrass.
2. Application Rate - 1 to 6 pints per acre depending on target species.
3. Cost - Habitat (Imazapyr) costs \$270 per gallon. Assuming the application rate of 16 oz. per acre and an application cost of \$39 per acre, the total cost would be \$73 per acre.
4. Use Considerations - Applications to public waters can only be made by federal, state, or local agencies or those applicators which are licensed or certified as aquatic pest control applicators and are authorized by state or local agencies.
5. Water Use Restrictions - Do not apply within ½ mile of potable water intakes. For applications within ½ mile of a potable water intake, the intake must be turned off for a minimum of 48 hours. Do not apply within 1 mile of active irrigation intakes on still or slow moving waters. Irrigation water usage may be continued 120 days after application or when Habitat (Imazapyr) residue levels are determined by laboratory analysis to be 1.0 ppb or less.
6. Aerial Applications may only be made by helicopter.

H. Triclopyr (Renovate 3, Tahoe)

1. Target Plants - Alligatorweed, Eurasian watermilfoil, water hyacinth, parrotfeather, and water primrose.
2. Application Rate - 2-8 qts. per acre depending on target species.
3. Cost - Triclopyr products cost \$106 per gallon. Assuming the application rate of 2 qts per acre and an application cost of \$39 per acre, the total cost would be \$92 per acre.
4. Use Considerations - Triclopyr is not toxic to fish or wildlife at normal use concentrations. It can cause severe irritation to eyes and skin upon contact. It is suggested that it is used in a manner to reduce the possibility of drift. The proper personal protective equipment should be used as prescribed by the Federal label.
5. Water Use Restrictions - For floating and emergent applications do not apply within 200 feet of operating potable water intakes when using 4 - 8 qts per acre. There are no setback restrictions for potable water intakes when 2 qts. per acre or less is applied to emergent vegetation. To make applications within these restricted areas, follow the label directions. There are no restrictions on the use of treated water for recreational purposes or for livestock consumption.

II. Biological Control

A. Alligatorweed Flea Beetle (*Agasicles hygrophila*)

1. Target Plant - Alligatorweed
2. Stocking Rate - 600-1,000 per acre.
3. Cost - The U.S. Army Corps of Engineers office in Palatka, Florida will provide lots of 6,000 flea beetles for the cost of shipping which is about \$50 per shipment. Flea beetles may also be obtained from the U.S. Department of Agriculture.
4. Use Considerations - Flea beetles feed only on alligatorweed and pose no threat to desirable plant species. They produce no adverse impact on the aquatic environment. As with all biological control agents, flea beetles may not remain in the area where stocked but may migrate to other areas of alligatorweed infestation. These insects are not able to survive severe winters and may require occasional restocking. The effectiveness of these insects may be enhanced by use with an aquatic herbicide such as 2,4-D, or Rodeo.

B. Alligatorweed Stem Borer Moth (*Vogtia malloi*)

1. Target Plant - Alligatorweed
2. Cost - Approximately the same as for flea beetle.
3. Use Considerations - Same as for flea beetle.

C. Alligatorweed Thrip (*Amynothrips andersonii*) - This insect feeds on alligatorweed and has been stocked in South Carolina. It has failed to become established in the State and is considered less desirable than flea beetles or stem borers for control of alligatorweed.

D. Triploid White Amur or grass carp (*Ctenopharyngodon idella*)

1. Target Plant - Primarily submersed plants including Brazilian elodea, hydrilla, bladderwort, coontail, naiads, pondweeds.
2. Cost - Triploid white amur cost \$4 to \$7 each. At a stocking rate of 15 to 25 fish per vegetated acre, the total cost could range from \$60 to \$175 per acre.
3. Use Considerations - Only the triploid (sterile) white amur may be stocked in South Carolina for aquatic weed control. Introduction and stocking of this fish is regulated by the S.C. Department of Natural Resources and requires a permit. Escapement over some dams may occur during high flow periods. Use of barriers in some lakes should prevent fish loss. While grass carp are effective on a wide variety of submersed

plants, they generally do not provide effective control of watermilfoil species. Plants should be carefully identified prior to stocking to ensure proper stocking rates and potential efficacy.

- E. Tilapia (*Tilapia sp.*) - Several species of this herbivorous fish have been used to control filamentous algae and submersed macrophytes. Tilapia cannot overwinter in South Carolina. Introduction of fish is regulated by the S.C. Department of Natural Resources.

III. Mechanical Control

A. Harvesters, Cutters, Dredges and Draglines

1. Target Plants - All species
2. Cost - Harvesters range in cost from \$5,000 to over \$150,000 for the initial investment. Operating cost range from \$300 to \$700 per acre.
3. Use Consideration - Harvesters can be used in irrigation and drinking water supplies without water use restrictions. They may actually spread some plants such as Brazilian elodea and hydrilla by dispersing plant fragments which form new colonies. Harvesting requires the availability of a land disposal site for harvested plants. These devices cannot be used on water bodies which have debris and obstructions which interfere with operation. Harvesters are slow, with a maximum coverage of about five acres per day.

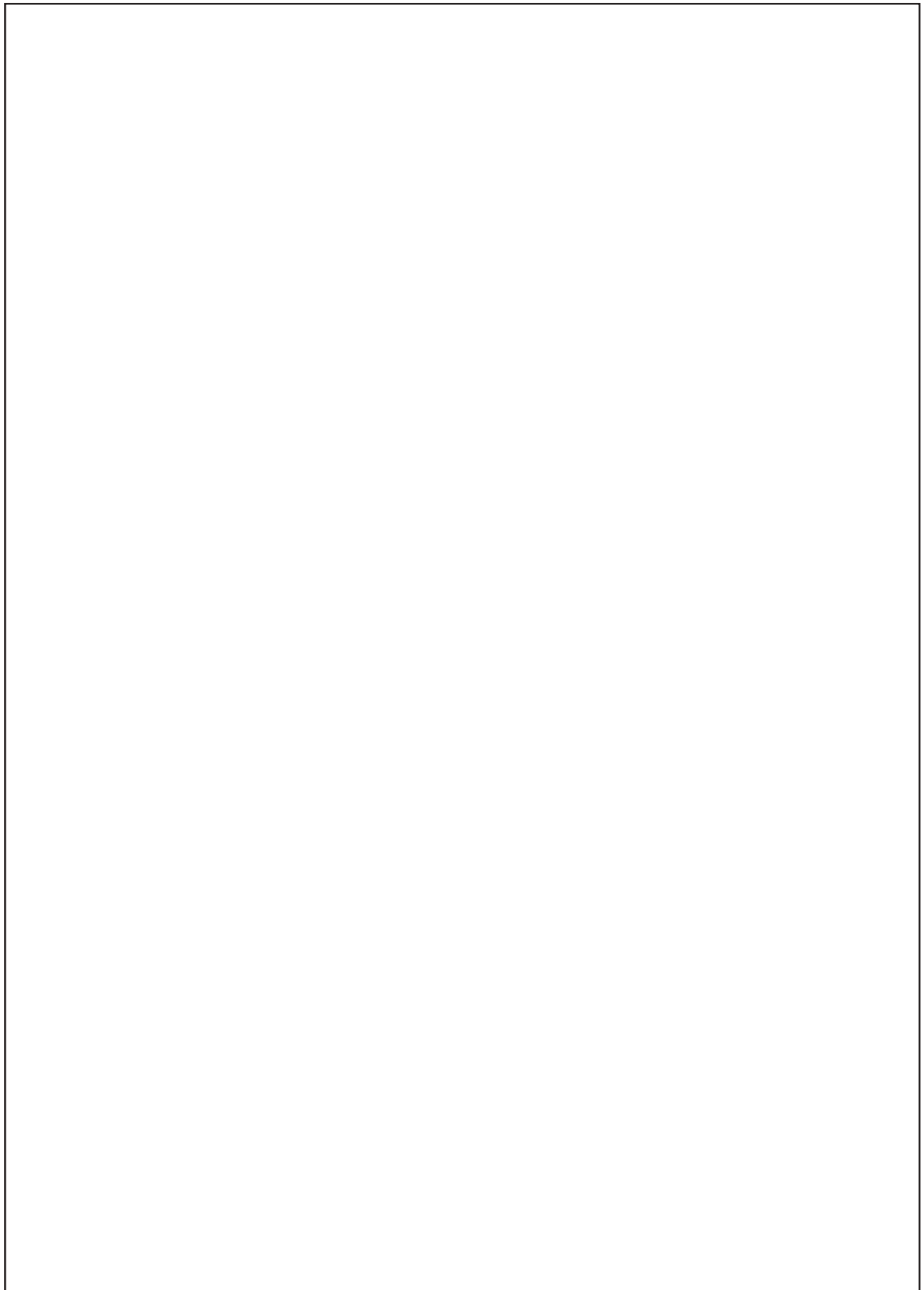
B. Fiberglass Bottom Screens

1. Target Plants - All species which root in the bottom.
2. Cost \$10,000 per acre.
3. Use Considerations - Bottom screens may be detrimental to bottom-dwelling aquatic organisms. Due to high cost, use is usually restricted to beaches and other swimming areas where a relatively small area of control is required.

IV. Environmental Alterations

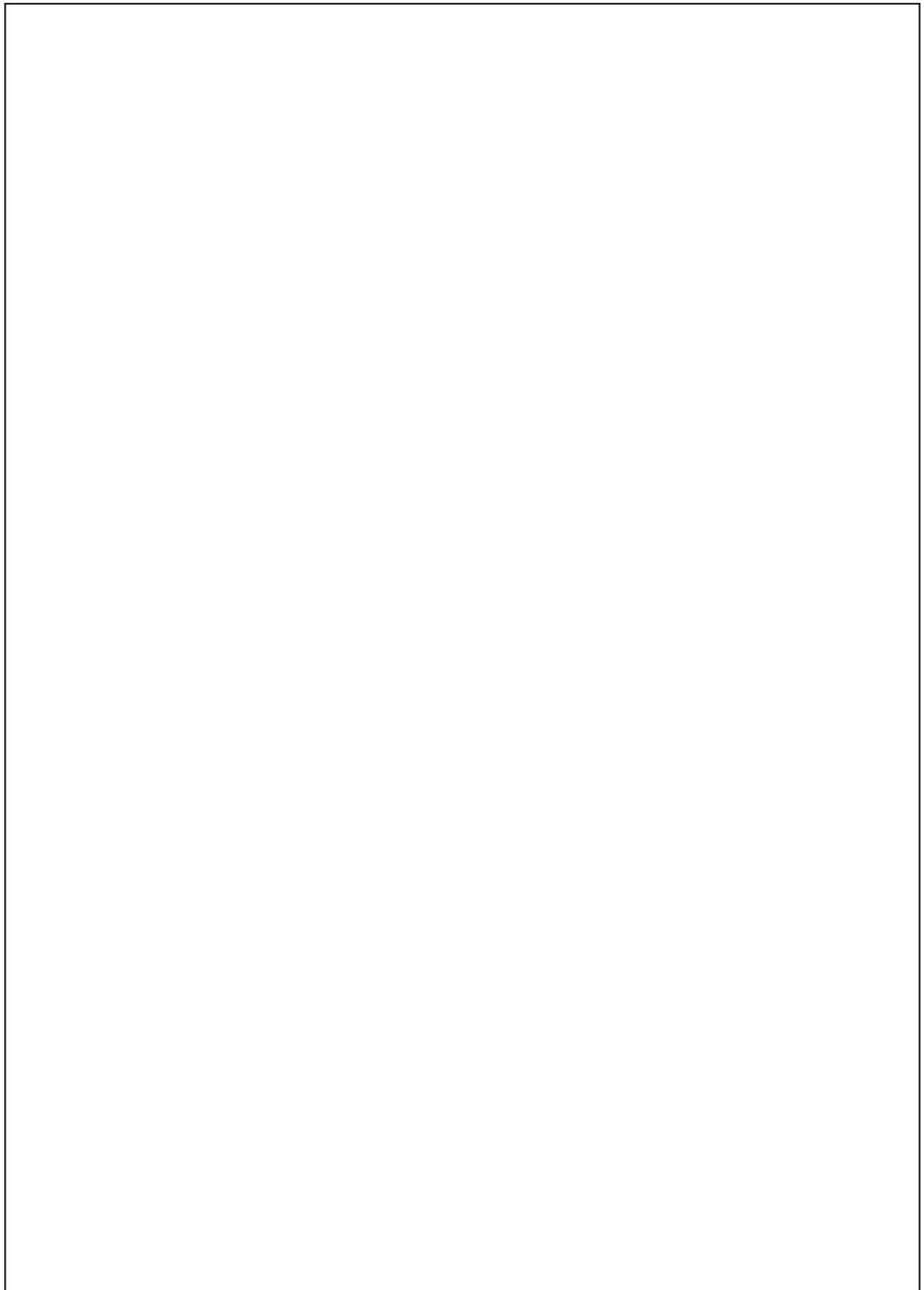
- A. Water Level Manipulation - Some species of aquatic plants can be controlled by a periodic raising or lowering of water level. Shoreline grasses, cattails, and *Phragmites* can be controlled, to some extent, by maintaining higher than normal water levels during the plant growing season. Periodic lowering of water and drying of the bottom can reduce abundance of a number of submersed and emersed species. Disadvantages are that water level fluctuation can adversely affect water uses such as recreation, hydroelectric power production, wildlife protection, and others. Also, some plant species may actually be favored by water level variations. Many factors must be considered before using this method for aquatic plant control.

- B. Reduction in Sedimentation and Nutrient Loading - Sedimentation decreases depth of the water body and increased the area where aquatic plants can grow. Nutrient enrichment resulting from man's activities usually does not create aquatic plant problems, but does contribute to existing problems. Reduction in these two environmental factors can assist in aquatic plant management, but is not a sufficient control method by itself. The mechanism for control of these factors is through implementation of Best Management Practices for Control of Non-Point Source Pollution developed by the S.C. Department of Health and Environmental Control, and through the wastewater discharge permitting program (NPDES) also administered by the S.C. Department of Health and Environmental Control.



APPENDIX E

SCDNR and Santee Cooper Aquatic Plant and Habitat Management Goals for the Santee Cooper Lakes



**S.C. Department of Natural Resources and Santee Cooper
Aquatic Plant and Habitat Management Goals
For the Santee Cooper Lakes**

Santee Cooper (S-C) and the S.C. Department of Natural Resources (DNR) recognize the Santee Cooper Lakes as a significant natural resource of the State. In order to provide balanced benefits to natural resources and the multiple uses of the lakes, the DNR and S-C (the parties) agree to cooperate in the management of aquatic vegetation and the habitat that it provides. The parties' goal is to maintain 10 % of the lakes' surface area as beneficial vegetated habitat for waterfowl, wildlife, fish and other aquatic organisms. In order to achieve this goal, the parties agree to the following:

1. The aquatic plant management goal for the Santee Cooper Lakes is to achieve a diverse assemblage of native aquatic vegetation in 10% of the total surface area of the lake and to effectively control non-native invasive species. The aquatic plant coverage should include a combination of submersed, floating leaf, and emergent plant species that provide habitat and food to game and non-game fish and wildlife species. At least 75% of the vegetation should be composed of species that are beneficial to waterfowl. This vegetation should be distributed throughout the lake system. However, localized control using chemical or mechanical methods may be necessary in areas where vegetation interferes with hydroelectric power production or other legitimate lake uses regardless of plant coverage and distribution.

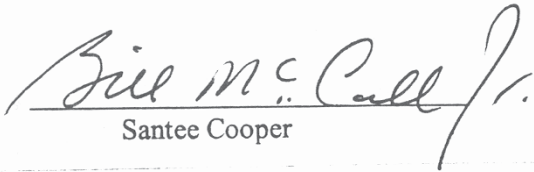
2. Monitoring

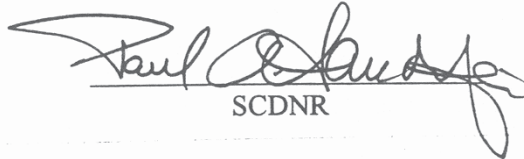
Aquatic Plants: S-C will annually monitor the vegetative community and extent of coverage. This monitoring may include aerial photography, visual surveys, hydro-acoustic transects and other appropriate measures - as deemed necessary by the parties in the annual work plan - to map the plant species and coverage. An annual report of the monitoring results will be completed at the end of each growing season and provided to the parties prior to preparation of the following year's work plan.

Fish and Wildlife: The DNR and Santee Cooper will cooperate in monitoring the health of the fishery and in conducting enhanced monitoring of waterfowl populations. The waterfowl population monitoring will consist of aerial waterfowl censuses. The census will be conducted 10 times each winter. The DNR will provide personnel and prepare an annual report to be distributed to both agencies. S-C will provide the flight time, approximately 30 hours each year.

3. Sterile grass carp will continue to be a major component of the long-term management strategy in controlling hydrilla. The DNR and S-C will meet at least annually to review the monitoring data and to develop recommendations for maintenance stocking levels and other control strategies. These recommendations will be jointly presented to the Aquatic Plant Management Council for consideration. The implementation of these recommendations will be subject to approval by the Council.

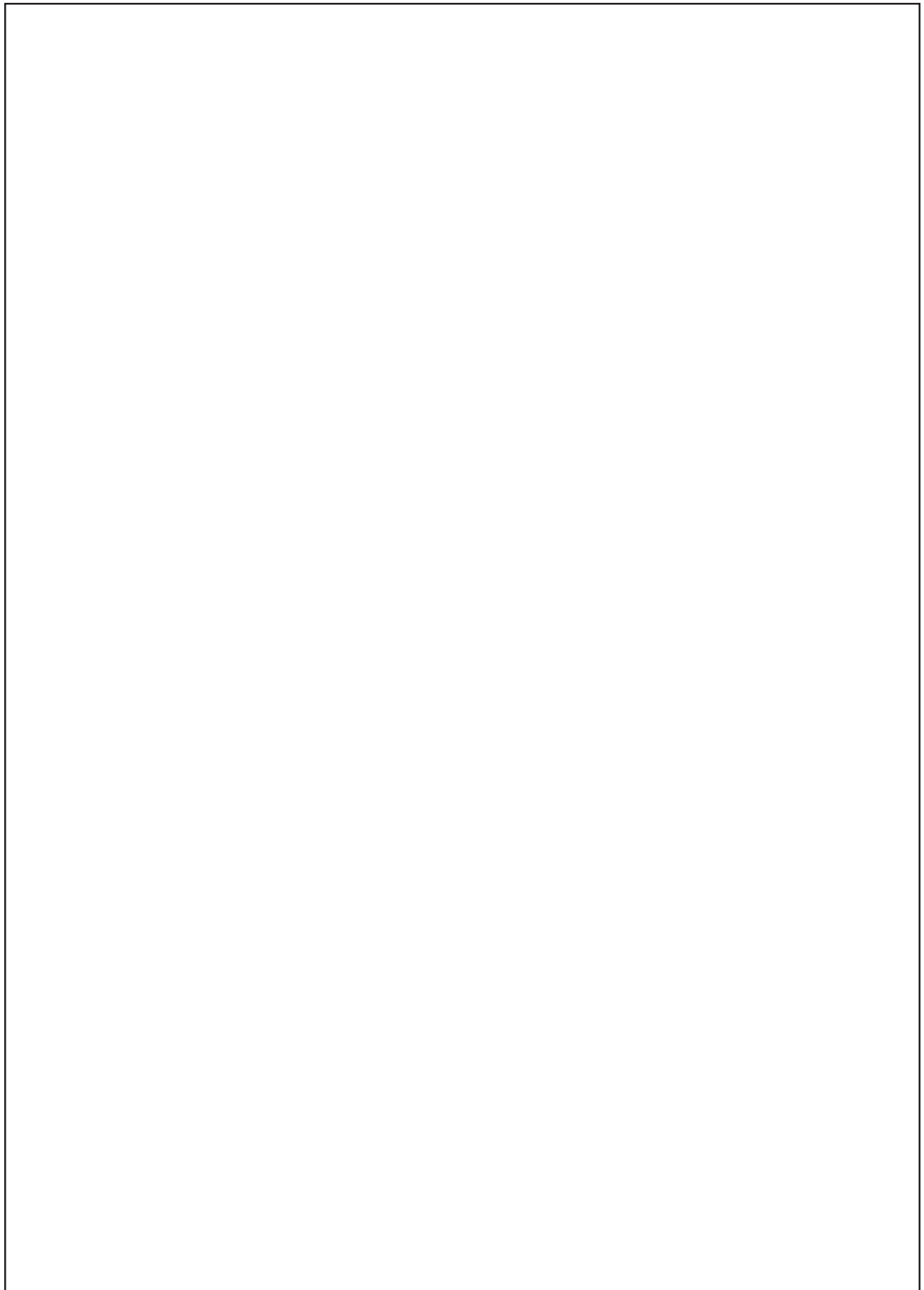
4. Aquatic vegetation will not be controlled in Santee Cooper Project water bodies that are totally isolated from the lakes unless it conflicts with specific water uses or is identified as a state or federal noxious weed and poses a threat to Lakes Marion and Moultrie.
5. In order to enhance native plant growth and habitat throughout the lake system, S-C and the DNR will cooperate in implementing innovative management techniques. These techniques could include such measures as constructing grass carp barriers, introducing desirable native plant species, enhancing wildlife/waterfowl management areas, and implementing strategic lake level management measures.
6. The DNR and S-C will meet annually to review the results of the monitoring and treatment programs to determine the effectiveness of the programs, and to develop annual work plans. Every five years the parties will meet to conduct a comprehensive review of the programs and to determine the success in meeting the overall management goals. Based upon this review, the provisions of this agreement may be modified, as deemed appropriate, by the mutual consent of the parties.


Santee Cooper


SCDNR

APPENDIX F

**Summary of Aquatic Plant
Control Expenditures**



SUMMARY OF AQUATIC PLANT CONTROL EXPENDITURES

During 1981, the Council received \$60,000 in Federal matching funds through the U.S. Army Corps of Engineers. The Council allocated \$57,000 of these funds to the S.C. Public Service Authority for plant management at Lake Marion. The Authority used these funds to chemically treat approximately 500 acres of the area uplake of the Rimini railroad trestle. The herbicide diquat was used to treat for Brazilian elodea and other submersed weed species. The remainder of the Federal funds were used to assist in development of the Council's management program.

During 1982, \$30,000 in Federal funds were allocated to the S.C. Public Service Authority for control of hydrilla and other nuisance plants at Lake Marion. An additional \$13,500 were allocated to Berkeley County for control of water hyacinths at Goose Creek Reservoir.

During 1983, \$155,000 in Federal matching funds were allocated to the S.C. Public Service Authority for plant control at Lake Marion. These funds were used to treat approximately 1,400 acres of upper Lake Marion with diquat, endothall and fluridone for control of Brazilian elodea, hydrilla and other submersed plants. The Council also provided \$4,500 in Federal matching funds to Berkeley County for maintenance control of water hyacinths at Goose Creek Reservoir.

During 1984, \$249,500 in Federal funds and \$40,500 in State funds were allocated to the S.C. Public Service Authority for aquatic weed control at Lake Marion. The S.C. Electric and Gas Company was allocated \$25,000 for control of hydrilla and other submersed aquatic weeds at Back River Reservoir. Berkeley County was allocated \$5,000 for maintenance control of water hyacinth at Goose Creek Reservoir.

Calendar year 1985 represented the first year of significant funding for aquatic plant management in South Carolina since the establishment of the Aquatic Plant Management Program in 1980. Funding was available from State and Federal sources over separate fiscal years. A total expenditure of \$701,349 was used to control nuisance aquatic plant populations on 29 water bodies around the State. Of this expenditure, \$98,377 was used for biological control by triploid grass carp and \$602,972 was used for chemical control operations.

During 1986, a mild winter coupled with low lake levels and clear water due to a severe drought resulted in an abundance of submersed aquatic plants. Hydrilla populations in Lake Marion and Back River Reservoir increased in coverage and new populations were discovered in the Cooper River ricefields. A total of 38 water bodies (4,925 acres) were managed for aquatic weeds at a cost of \$704,090. Herbicide applications were made on 33 lakes (4,441 acres) at a cost of \$673,979. Biological controls were implemented on nine water bodies around the State at a cost of \$30,111.

During 1987, a total of \$604,695 in State and Federal funds were expended for aquatic weed control in public waters. Chemical control work amounting to \$599,445 was conducted in

26 public water bodies. Biological control, including stocking triploid grass carp and alligator-weed flea beetles, was conducted at eight water bodies for a total expenditure of \$5,250.

During 1988, a total of \$631,164 in State, Federal, and local funds were expended for aquatic plant control activities in 25 water bodies. Because of reductions in the amount of Federal match from 70 percent to 50 percent of total control cost, local sponsors were for the first time required to provide at least 15 percent of control costs. Approved aquatic herbicides were applied to 3,258 acres on 21 water bodies at a total cost of \$583,764. Biological controls were implemented on four water bodies at a cost of \$47,400.

During 1989, a total of \$827,630 in Federal, State, and local funds were expended for aquatic plant control operations in 23 water bodies. Aquatic herbicides were applied to 2620 acres on 21 water bodies at a cost of \$422,009. A three year triploid grass carp stocking project was initiated on Lake Marion with the release of 100,000 sterile grass carp. Because this represents the largest such stocking in the country to date, biological control expenditures were substantially higher than in previous years, totaling \$405,621.

During 1990, a total of \$944,194 were expended for aquatic plant control activities on 24 water bodies. Herbicide treatments were made to all water bodies (2850 acres) at a cost of \$524,194. Lake Marion received its second installment of 100,000 triploid grass carp at a cost of \$420,000. Because of limited federal funds and a substantial increase in local funds (primarily from Santee Cooper), this was the first year that there were insufficient federal funds available to match all planned control operations. The Corps of Engineers provided 47 percent of total funding, while state and local entities provided 16 percent and 37 percent, respectively.

In 1991, aquatic plant management operations were conducted on 18 public water bodies at a total cost of \$1,965,387. The exceptionally large expenditure was a result of emergency control operations to alleviate blockage of the St. Stephen Hydroelectric facility on Lake Moultrie by hydrilla. A record high 6838 acres was treated with aquatic herbicides at a cost of \$1,505,771. Biological control agents were used on five lakes at a cost of \$459,615. Most of this included the third stocking of triploid grass carp in upper Lake Marion. While 50 percent of program funding was provided by the U.S. Army Corps of Engineers, 9 percent was provided by the State and 41 percent by local entities.

In 1992, 22 water bodies received control operations at a total cost of \$1,859,709. While last year's expenditures were higher, over 1,000 acres were treated by Santee Cooper at a cost of over \$200,000 but were not cost shared through the State program. Fifty percent of funding was provided by the U.S. Army Corps of Engineers, 8 percent by the State, and 42 percent by local entities. About 6,888 acres were treated with aquatic herbicide at a cost of \$1,447,864. Biological control agents (sterile grass carp and Tilapia) were introduced to six water bodies at a cost of \$411,845. This was the first year in which widespread hydrilla control was evident in upper Lake Marion from the grass carp. Hydrilla was controlled in over 6,500 acres in Stumphole, Low Falls, Elliotts Flats, and tree line areas. Compared to 1990 coverage, this represents an 80 percent reduction.

During 1993, a total of \$2,050,736 were expended for aquatic plant control activities on 27 water bodies. Forty-six percent of the funding was provided by the U.S. Army Corps of Engineers, 5 percent by the Department of Natural Resources, and 49 percent by various local sponsors. Aquatic herbicide treatments were made on 23 water bodies (8,125 acres) at a total cost of \$1,828,335. Biological control agents (grass carp and tilapia) were used on 11 lakes at a cost of \$222,400. Grass carp stocked in upper Lake Marion in 1989-92 provided control (over 9,000 acres) for the second consecutive year. As a result of this success, stocking efforts were initiated in Lake Moultrie with the release of 50,000 grass carp. Hydrilla was discovered in Lake Murray this year resulting in unplanned treatment operations at several boat ramps and swimming beaches.

During 1994, aquatic plant management operations were conducted on 28 water bodies at a total cost of \$2,876,763. The U.S. Army Corps of Engineers provided 50 percent of all funds, while the State provided 7 percent and local entities provided 43 percent. Aquatic herbicide treatments were conducted on all water bodies (9,090 acres) at a cost of \$2,370,025. Grass carp were stocked in five lakes to control 10,242 acres at a cost of \$506,738. Lake Moultrie received the most grass carp (150,000 fish) to help increase the number of fish to target levels. Grass carp continue to control over 9,000 acres in upper Lake Marion for the third straight year. This year hydrilla was found in Lake Wateree for the first time resulting in unplanned treatments to attempt to eliminate it.

In 1995, a total of \$2,804,206 were expended for aquatic plant control activities on 30 water bodies. Fifty percent of the funding was provided by the U.S. Army Corps of Engineers, 44 percent was provided by local sponsors, and the state contributed 6 percent. Some level of herbicide treatment occurred on all the water bodies totalling about 9,710 acres at a cost of \$2,367,622. A total of 97,526 grass carp were stocked in five lakes at a total cost of \$435,084. Most of these were stocked in the Santee Cooper lakes (91,000) and Goose Creek Reservoir (6,000). Hydrilla was found in Lake Keowee for the first time this year which resulted in an unplanned treatment. Also *Salvinia molesta*, a federal noxious weed, was discovered in a private pond in Colleton County. Efforts were made to eradicate the infestation with treatments by the landowner and the state. Grass carp continue to provide excellent control in over 9,000 acres in upper Lake Marion; however, floating water hyacinths now infest much of this area impacting primarily shoreline and swamp areas.

Control expenditures in 1996 were about one-half of those in 1995 due in part to successful results from control efforts in previous years and in part to reductions in federal funding. A total of 19 water bodies were managed for nuisance species at a total cost of \$1,151,501; the Corps of Engineers provided 31%, the State provided 10%, and local entities provided 59%. Herbicide treatments were conducted in 4,920 acres at a cost of \$888,685; biocontrol agents were used in four lakes at a cost of \$262,816. Hydrilla coverage on the Santee Cooper lakes (Lakes Marion and Moultrie) declined by almost 80% due apparently to the successful stocking of sterile grass carp. As a result, herbicide treatments of hydrilla were reduced by a comparable amount. Hydrilla coverage has been essentially eliminated on Lake Wateree and substantially reduced on Lake Keowee through a combination of herbicide treatments and drawdowns. A large drawdown and treatment on Lake Murray this year is hoped to have similar results.

During 1997, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$459,783. This represents a 60% reduction from control costs in 1996 due to very successful hydrilla management efforts on the Santee Cooper lakes and Lake Murray coupled with limited Federal matching funds. Matching funds from the Corps of Engineers composed only 2 percent of total costs, while State and Local funds made up 38 percent and 60 percent, respectively. Sterile grass carp were stocked in five lakes to control 292 acres of submersed plants at a cost of \$15,951. Aquatic herbicides were used to treat 3,762 acres at a total cost of \$443,832. Most herbicide treatments (58%, 2,181 acres) were focused on water hyacinth which has expanded its range and now is found on six major water bodies. Water hyacinth treatments on the Ashepoo River were greater than originally planned and treatments on the Waccamaw River were unanticipated. Hydrilla coverage on the Santee Cooper lakes continued to decline in 1997 due to successful control by sterile grass carp resulting in sharp reductions in management expenditures. The drawdown and herbicide treatment on Lake Murray in 1996 resulted in better than anticipated hydrilla control this year. Hydrilla acreage was reduced 88 percent with a 45 percent reduction in shoreline miles.

Limited hydrilla coverage on the Santee Cooper Lakes, Lake Murray and Goose Creek Reservoir during 1998 helped reduce overall control expenditures for the third consecutive year. Total control cost for 1998 were 40% less than in 1997. A total of 1,862 acres on 17 water bodies were managed at a cost of \$273,223. The Department of Natural Resources provided 47% of total funding, while 25% was provided by the Corps of Engineers, and 28% by various local entities. Sterile grass carp are effectively controlling hydrilla growth in the Santee Cooper Lakes and Goose Creek Reservoir. About one-half of all herbicide treatments (940 ac.) were focused on water hyacinth control on coastal rivers and impoundments.

A total of 3,259 acres on 19 water bodies were managed in 1999 at a total cost of \$453,071. Funding support was 34% State (SCDNR), 21% Federal (USCOE), and 45% local match. Most herbicide treatments (1506 acres, 46%) were directed at controlling the growth of water hyacinth in seven water bodies. Hydrilla growth remains limited statewide due to control operations in previous years. Grass carp in the Santee Cooper Lakes (Lakes Marion and Moultrie) and Goose Creek Reservoir are effectively controlling hydrilla growth in those lakes. Hydrilla regrowth was evident in Lake Murray at the end of the year; however, higher than normal lake levels restricted herbicide treatments. Therefore, significant regrowth is expected next year.

During 2000, aquatic plant management operations were conducted on 21 water bodies at a total cost of \$483,236. State budget cuts at the end of the calendar year reduced control efforts by 21% of planned expenditures and shifted costs to local sponsors. Seventy percent of total costs were borne by local entities with the state paying the rest. Most of the control effort was focused on water hyacinth (31%), followed by hydrilla (25%) and Pithophora (19%). Hydrilla regrowth was significant on Lake Murray as predicted. Grass carp continue to control hydrilla on Goose Creek Reservoir and Lake Marion and Lake Moultrie.

During 2001, aquatic plant management operations were conducted on 2,775 acres on 25 water bodies at a total cost of \$508,075. Due to State budget cuts virtually all control costs were

paid for with federal (41%) and local funds (59%). Hydrilla treatments were up this year (1,550 acres) because of a resurgence of hydrilla growth on Lake Murray; however, water hyacinth treatments were especially low (186 acres) due to a very cold period in December. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

During 2002, aquatic plant management operations were conducted on 2,239 acres on 17 water bodies at a total cost of \$297,236. Due to State budget cuts virtually all control costs were paid for with federal (37%) and local funds (63%). Water hyacinth treatments were up this year (1,186 acres) because of a milder than normal winter; however, hydrilla treatments were especially low (390 acres) due to the inability to treat Lake Murray. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

In 2003, aquatic plant management operations were conducted on 6135.40 acres in 12 water bodies at a total cost of \$639,328. Due to state budget cuts all control costs were paid for with federal (38%) and local funds (62%). Included in this total are the stocking of 64,500 sterile grass carp in Lake Murray to control 4300 acres of hydrilla at a cost of \$369,529. About 57% of all herbicide treatments (1005 ac.) were focused on water hyacinth control on coastal rivers and impoundments. Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes.

A total of 2764 acres were treated in 2004 at a total cost of \$470,815. Local sponsors provided 41% of the cost, while the Corps of Engineers provided 30%. Funds from the State's Water Recreational Resource Fund (boat gas tax) paid for 29% of all control costs. The focus of most control was on water hyacinth (931 acres) and Phragmites (710 acres). Grass carp continue to provide effective control of hydrilla on Goose Creek Reservoir and the Santee Cooper Lakes. Preliminary surveys of Lake Murray indicate that grass carp stocked in 2003 are beginning to provide some control of hydrilla. The drawdown on Lake Murray over the past two years is also providing good hydrilla control in the drawdown zone.

Table 2000-A . Summary of Expenditures by Source for Control Operations During 2000.

Water Body Name	Total Cost	State	Local	Local Sponsor
Back River Reservoir	\$89,960	\$45,747	\$44,212	CCPW/SCE&G/NWS
Cooper River	\$14,196	\$4,259	\$9,937	Berkeley County
Cromer Road Pond	\$118	\$118	\$0	-
Goose Creek Reservoir	\$7,570	\$5,299	\$2,271	Charleston CPW
Jumper Pond	\$79	\$79	\$0	-
Lake Greenwood	\$71,465	\$53,909	\$17,555	Duke Power/ Greenwd Co.
Lake Marion	\$110,299	\$13,351	\$96,948	Santee Cooper
Lake Moultrie	\$5,739	\$2,933	\$2,806	Santee Cooper
Potato Cr. Impoundment	\$7,301	\$1,752	\$5,549	Santee Cooper
Taw Caw Cr. Impoundment	\$9,145	\$4,555	\$4,590	Santee Cooper
Lake Murray	\$136,215	\$1,215	\$135,000	SCE&G
Lake Wateree	\$752	\$288	\$464	Duke Power Co.
Pee Dee River	\$7,021	\$3,165	\$3,856	Georgetown County
Waccamaw River	\$912	\$368	\$544	Georgetown County
Lake Warren	\$3,019	\$1,509	\$1,509	SCDNR Fisheries
John D. Long Lake	\$2,415	\$1,208	\$1,208	SCDNR Fisheries
Charles Towne Landing St Pk	\$1,737	\$0	\$1,737	SC Parks, Rec, Tourism
Huntington Beach State Pk	\$2,460	\$0	\$2,460	SC Parks, Rec, Tourism
Kings Mt. St. Pk.	\$2,096	\$0	\$2,096	SC Parks, Rec, Tourism
Lee State Pk.	\$911	\$0	\$911	SC Parks, Rec, Tourism
Little Pee Dee St. Pk.	\$9,828	\$6,880	\$2,948	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$17,033	\$6,880	\$10,153	
<i>Non Santee Cooper Total</i>	\$350,752	\$124,043	\$226,710	
<i>Santee Cooper Total</i>	\$132,484	\$22,591	\$109,893	
GRAND TOTAL	\$483,236	\$146,634	\$336,602	

Table2000-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2000.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	
Back River Reservoir	Hydrilla	112.3	\$22,719.40	\$202.40	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, and water quality	80% control
		61.0	\$24,156.00	\$396.00	Sonar AS & K-Tea	1qt/ac + 2gal/ac		60% initial
	Water hyacinth	13.0	\$1,142.60	\$87.89	Reward	0.5 gal/ac	and minimize floating islands and	with 100%
	Water primrose	406.0	\$41,941.60	\$103.30	Rodeo	7.5 pt/ac	impacts to water intakes.	control of h
TOTAL		592.3	\$89,959.60	\$151.89				with fall re
Cooper River	Hydrilla	60.0	\$12,144.00	\$202.40	Komeen	16 gal/ac	Reduce water hyacinth to greatest extent possible; provide boat trails	80% control
	Water primrose	20.0	\$2,052.00	\$102.60	Rodeo	7.5 pt/ac	to main channel through hydrilla.	control of h
TOTAL		80.0	\$14,196.00	\$177.45				due to fun
Cromer Road Pond	Water hyacinth	1.5	\$117.75	\$78.50	Reward	0.5 gal/ac	Eliminate all water hyacinth.	90% control
Goose Creek Reservoir	Water primrose	47.0	\$4,822.20	\$102.60	Rodeo	7.5 pt/ac	Reduce water hyacinth to greatest extent possible; reduce w. primrose	95% control
	Water hyacinth	35.0	\$2,747.50	\$78.50	Reward	0.5 gal/ac	for public use and flood flow.	hyacinth; h
TOTAL		82.0	\$7,569.70	\$92.31				carp.
Jumper Pond	Water hyacinth	1.0	\$78.50	\$78.50	Reward	0.5 gal/ac	Eliminate all water hyacinth.	90% control
Lake Greenwood	Pithophora	572	\$63,210.23	\$110.51	K-Tea, Cutrine Plus, Clearigate		Minimize growth of algae in Reedy R. arm; reduce naiad along developed shoreline.	60% control
	Slender naiad	41.5	\$8,254.34	\$199.14	Aquathol K	3.5 gal/ac		treatment c
TOTAL		613.5	\$71,464.57	\$116.50				kept most
								90% control
Lake Marion	American lotus, waterlily, watershed	12.5	\$2,995.16	\$239.61	Reward, Rodeo, and, Arsenal EUP	0.5 gal/ac, 7.5 pts/ac	Suppress hydrilla to minimize spread and impacts to water uses;	>90% control
	Cabomba, watermilfoil	11.0	\$3,214.76	\$292.25	Sonar SRP and AS	10 lbs/ac, 0.2 gal/ac	reduce w. hyacinth to enhance boating, fishing, hunting and public access; red.	for algae a
	Giant cutgrass	39.5	\$5,322.37	\$134.74	Arsenal EUP	0.25-0.375 gal/ac	cutgrass to enhance waterfowl habitat;	Pithophora
	Hydrilla	2.8	\$893.18	\$318.99	Aquathol K, Sonar	10 gal/ac, 0.25 gal/ac	reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	
	Lyngbya, Pithophora	79.0	\$14,294.64	\$180.94	Clearigate, Nautique K-Tea, Reward	1 gal/ac, 0.5 gal/ac, 6 gal/ac, 2 gal/ac		
	Water Hyacinth	954.0	\$77,624.96	\$81.37	Reward	0.5 gal/ac		
	Water primrose, alligator-weed, maidencane	36.0	\$5,300.67	\$147.24	Arsenal EUP	0.25 gal/ac		
	Parrotfeather	5.0	\$653.42	\$130.68	Rodeo, Reward	0.75 gal/ac, 1 gal/ac		
TOTAL		1139.8	\$110,299.16	\$96.77				
Lake Moultrie	American lotus, waterlily	4.00	\$820.09	\$205.02	Reward	1 gal/ac	Suppress hydrilla to minimize spread and impacts to water uses;	>90% control
	Bladderwort	3.00	\$880.79	\$293.60	Reward	1 gal/ac	reduce w. hyacinth to enhance boating, fishing, hunting and public access; red.	end of the
	Cabomba, hydrilla, watermilfoil, watershed	2.90	\$746.43	\$257.39	Sonar SRP	10 lbs/ac	other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	for bladder
	Water primrose, alligator-weed, maidencane, cutgrass	26.00	\$3,291.70	\$126.60	Arsenal EUP	0.25 gal/ac		species; <
TOTAL		35.9	\$5,739.01	\$159.86				
Potato Creek Impoundment	Hydrilla	29.0	\$7,301.03	\$251.76	Aquathol K	8-10 gal/ac	Suppress hydrilla growth to min. spread.	>90% control
Taw Caw Cr. Imoundment	Coontail	29.0	\$6,272.55	\$216.29	Aquathol K	5 gal/ac	Reduce problem plants to enhance public access and use.	>90% control
	Lyngbya, Pithophora	4.0	\$333.94	\$83.49	K-Tea & Cutrine Plus	5-6 gal/ac		of the seas
	Water primrose, alligator-weed, cutgrass, cattail	20.0	\$2,538.23	\$126.91	Arsenal EUP, Rodeo	0.25 gal/ac, 0.75 gal/ac		
TOTAL		53.0	\$9,144.72	\$172.54				
Lake Murray	Hydrilla	673.0	\$136,214.60	\$202.40	Komeen	16 gal/ac	Reduce hydrilla to min. spread and imp. to public access, use, and water intakes.	70-98% co
								areas very
Lake Wateree	Hydrilla	6.0	\$752.48	\$125.41	Aquathol K, Komeen	2.5 gal/ac, 5 gal/ac	Eliminate hydrilla from site.	>95% rem
John D. Long Lake	Pondweeds, naiads	20.0	\$2,415.00	\$120.75	Tripliod grass carp	20 fish/ac (400 fish)	Reduce problem plants to enhance fishing and boating.	90% control
Lake Warren	Braz. elodea, watermilfoil	25.0	\$3,018.75	\$120.75	Tripliod grass carp	20 fish/ac (500 fish)	Reduce problem plants to enhance fishing and boating.	25% control
Pee Dee River	Water hyacinth	87.0	\$7,020.75	\$80.70	Reward	0.5-0.75 gal/ac	Reduce water hyacinths to greatest extent possible.	90% control
Waccamaw River	Water hyacinth	9.0	\$706.50	\$78.50	Reward	0.5 gal/ac	Reduce water hyacinths and	95% control

Table2000-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2000.								
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	
	Phragmites	2.0	\$205.20	\$102.60	Rodeo	7.5 pt/ac	Phragmites to greatest extent possible.	65% contr
TOTAL		11.0	\$911.70	\$82.88				
State Park Lakes								
Charles Towne Landing SP	Duckweed	5.0	\$1,363.75	\$272.75	Sonar AS	1 pt/ac	Provide public access for bank fishing	75% contr
	Alligatorweed, cattail	2.0	\$373.50	\$186.75	Rodeo	7.5 pts/ac	and improve aesthetics.	of cattails
TOTAL		7.0	\$1,737.25	\$248.18				
Huntington Beach State Pk.	Cattails, Phragmites	15.0	\$2,460.30	\$164.02	Rodeo	7.5 pt/ac	Remove cattails to improve waterfowl	80-85% co
							use; public wildlife observation, fishing.	
Kings Mt. State Park	Slender naiad	8.0	\$2,096.38	\$262.05	Aquathol K	4 gal/ac	Reduce naiads in swimming and boating	70% contr
							areas.	
Lee State Park	Watermilfoil	2.0	\$911.10	\$455.55	2, 4-D granular	200 lbs/ac	Reduce watermilfoil to enhance fishing	90% contr
							and canoeing.	
Little Pee Dee State Park	Watermilfoil, cowli	20.0	\$9,828.00	\$491.40	2, 4-D granular	200 lbs/ac	Reduce plants to enhance swimming,	75% contr
							boating, and fishing.	waterm
State Park Lakes		52.0	\$17,033.03	\$327.56				
Santee Cooper Lakes		1257.7	\$132,483.92	\$105.34				
GRAND TOTAL:		3501.9	\$483,236.35	\$137.99				

Table 2001-A. Summary of Expenditures by Source for Control Operations During 2001.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$115,870	\$36,511	\$0	\$79,359	CCPW/SCE&G/NWS
Cooper River	\$11,468	\$5,734	\$0	\$5,734	Berkeley County
Cromer Road Pond	\$827	\$0	\$248	\$579	-
Goose Creek Reservoir	\$9,916	\$4,085	\$0	\$5,831	Charleston CPW
Lake Greenwood	\$14,755	\$0	\$0	\$14,755	Duke Power/ Greenwd Co.
Lake Marion	\$21,837	\$9,682	\$0	\$12,155	Santee Cooper
Lake Moultrie	\$14,582	\$5,957	\$0	\$8,624	Santee Cooper
Church Branch Impoundment	\$4,210	\$1,328	\$0	\$2,883	Santee Cooper
Dean Swamp Impoundment	\$12,804	\$5,184	\$0	\$7,620	Santee Cooper
Fountain Lake	\$2,695	\$1,003	\$0	\$1,692	Santee Cooper
Potato Cr. Impoundment	\$9,023	\$4,511	\$0	\$4,511	Santee Cooper
Taw Caw Cr. Impoundment	\$16,459	\$6,551	\$0	\$9,908	Santee Cooper
Lake Murray	\$245,969	\$122,984	\$0	\$122,984	SCE&G/Lexington Co.
Lake Wateree	\$147	\$0	\$0	\$147	Duke Power Co.
Little Pee Dee River	\$10,162	\$3,356	\$0	\$6,806	Horry & Marion County
Waccamaw River	\$203	\$0	\$102	\$101	Georgetown County
Lake Cherokee	0*	\$0	\$0	\$0	SCDNR Fisheries
Mountain Lake	0*	\$0	\$0	\$0	SCDNR Fisheries
Barnwell State Park	\$4,550	\$0	\$0	\$4,550	SC Parks, Rec, Tourism
Charles Towne Landing St Pk.	\$390	\$0	\$0	\$390	SC Parks, Rec, Tourism
Huntington Beach State Pk	\$1,950	\$0	\$0	\$1,950	SC Parks, Rec, Tourism
Kings Mt. State Park	\$1,260	\$0	\$0	\$1,260	SC Parks, Rec, Tourism
Little Pee Dee State Park	\$5,175	\$0	\$0	\$5,175	SC Parks, Rec, Tourism
Poinsette State Park	\$2,275	\$0	\$0	\$2,275	SC Parks, Rec, Tourism
Santee State Park	\$1,550	\$0	\$0	\$1,550	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$17,150	\$0	\$0	\$17,150	
<i>Non Santee Cooper Total</i>	\$426,466	\$172,670	\$350	\$253,446	
<i>Santee Cooper Total</i>	\$81,609	\$34,215	\$0	\$47,394	
GRAND TOTAL	\$508,075	\$206,885	\$350	\$300,840	

* received complimentary grass carp from Santee Cooper.

Table 2001-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2001.

Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Efficacy
Back River Reservoir	Hydrilla	238.0	\$50,684.48	\$212.96	Komeen	16 gal/ac	Reduce problem plants to enhance public access, use, and water quality and minimize floating islands and impacts to water intakes.	30% control
		75.0	\$30,888.00	\$411.84	Sonar AS & K-Tea	1qt/ac + 2gal/ac		with Komeen
	Water hyacinth	77.0	\$6,286.28	\$81.64	Reward	0.5 gal/ac		water primrose
	Water primrose	275.0	\$28,011.22	\$101.86	Eagre	7.5 pt/ac		control of wa
TOTAL:		665.0	\$115,869.98	\$174.24				
Cooper River	Hydrilla	50.0	\$10,648.00	\$212.96	Komeen	16 gal/ac	Reduce water hyacinth to greatest extent possible; provide boat trails to main channel through hydrilla.	80% control
	Water primrose	8.0	\$819.52	\$102.44	Arsenal (EUP)	32 oz/ac		control of hya
	TOTAL:	58.0	\$11,467.52	\$197.72				
Cromer Road Pond	Water hyacinth	8.5	\$826.54	\$97.24	Reward	0.5-0.75 gal/ac	Eliminate all water hyacinth.	85% control
Goose Creek Reservoir	Water primrose	43.0	\$4,364.07	\$101.49	Eagre	7.5 pt/ac	Reduce water hyacinth to greatest extent possible; reduce w. primrose for public use and flood flow.	75% control
	Water hyacinth	68.0	\$5,551.52	\$81.64	Reward	0.5 gal/ac		water hyacin
	TOTAL:	111.0	\$9,915.59	\$89.33				carp.
Lake Greenwood	Pithophora	60.0	\$8,160.00	\$136.00	Citrine Plus	60 lbs/ac	Minimize growth of algae in Reedy R. arm; reduce naiad along developed shoreline.	95% control
	Slender naiad	44.0	\$6,595.16	\$149.89	Aquathol K	3.5 gal/ac		60% control
	TOTAL:	104.0	\$14,755.16	\$141.88				
Lake Marion	American lotus, waterlily, watershield	5.0	\$462.68	\$92.54	Reward, Eagre, and, Arsenal (EUP)	0.5 gal/ac	Manage hydrilla to minimize spread and impacts to water uses; reduc. cutgrass to enhance waterfowl habitat; reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	>90% contro
	Giant cutgrass	28.8	\$3,619.66	\$125.68	Arsenal (EUP)	0.25-0.375 gal/ac		for algae and
	Lyngbya, Pithophora	47.0	\$7,125.45	\$151.61	Cleanigate, Nautique	1 gal/ac, 0.5 gal/ac,		parrotfeather
	Water primrose, alligator-weed, maidencane	59.2	\$6,880.29	\$116.22	Arsenal (EUP), Eagre, AquaNeat	0.25 gal/ac; 0.75 gal/ac		Pithophora a
	Parrotfeather	1.0	\$238.25	\$238.25	Rodeo, Reward	0.75 gal/ac, 1 gal/ac		and freezing
	Water hyacinth	32.0	\$3,510.27	\$109.70	Reward	0.5 gal/ac		
	TOTAL:	173.0	\$21,836.60	\$126.22				
Lake Moultrie	American lotus, waterlily	13.5	\$1,468.83	\$108.80	Reward	1 gal/ac	Manage hydrilla to minimize spread and impacts to water uses; reduc. cutgrass to enhance waterfowl habitat; reduce other problem plant species in priority use areas to enhance public access and use, and maintain electric power generation.	>90% contro
	Cabomba, watermilfoil	4.5	\$1,042.15	\$231.59	Sonar SRP	10 lbs/ac		end of the se
	Wat. prim., alligatorweed	86.0	\$9,016.38	\$104.84	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac		for some em
	Giant cutgrass, Cattail	22.5	\$2,583.75	\$114.83	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac		
	Bladderwort	1.0	\$267.43	\$267.43	Reward	1 gal/ac		
	Hydrilla	0.7	\$203.07	\$290.10	Reward/Komeen	2 gal/ac + 3.5 gal/ac		
	TOTAL:	128.2	\$14,581.61	\$113.74				
Church Branch Impound.	Wat. primrose, alligatorwd, giant cutgrass, cattail	4.0	\$583.69	\$145.92	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% contro
	Watermilfoil, parrotfeather	9.5	\$3,626.71	\$381.76	Sonar AS, 2, 4D BEE	0.2 gal/ac; 200 lbs/ac		
	TOTAL:	13.5	\$4,210.40					
Dean Swamp Impound.	Wat. primrose, alligatorwd, giant cutgrass, cattail	15.5	\$1,757.58	\$113.39	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% contro
	Coontail	12.0	\$3,087.23	\$257.27	Aquathol K	5 gal/ac		65% control
	Lyngbya, Pithophora	26.5	\$7,958.95	\$300.34	K-Tea, Reward,	6 gal/ac; 2 gal/ac		
	TOTAL:	54.0	\$12,803.76	\$237.11	Hydrothol 191	0.5 gal/ac		
Fountain Lake	Wat. primrose, alligatorwd, giant cutgrass, cattail	7.5	\$927.80	\$123.71	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac	Reduce problem plants to enhance public access and use.	>90% contro
	American lotus, waterlily	6.0	\$1,767.37	\$294.56	Arsenal (EUP), Eagre	0.25 gal/ac; 0.75gal/ac		>90% contro
	TOTAL:	13.5	\$2,695.17					
Potato Creek Impoundment	Hydrilla	30.0	\$9,022.81	\$300.76	Aquathol K, Hydrothol	5 gal/ac, 1 gal/ac	Reduce problem plants to enhance public access and use.	>80% contro
Taw Caw Cr. Impoundment	Coontail	53.0	\$12,909.76	\$243.58	Aquathol K	5 gal/ac	Reduce problem plants to enhance public access and use.	>90% contro
	Water primrose, alligator-weed, cutgrass, cattail	35.0	\$3,548.75	\$101.39	Arsenal EUP, Eagre	0.25 gal/ac, 0.75 gal/ac		
	TOTAL:	88.0	\$16,458.51	\$187.03				
Lake Murray	Hydrilla	1155.0	\$245,968.80	\$212.96	Komeen	16 gal/ac	Reduce hydrilla to min. spread and imp. to public access, use, and water intakes.	70-99% cont
Lake Wateree	Hydrilla	1.0	\$147.14	\$147.14	Komeen	10 gal/ac	Eliminate hydrilla from site.	>95% contro
Little Pee Dee River	Alligatorweed	100.0	\$10,162.30	\$101.62	Eagre, Arsenal (EUP)	0.75 gal/ac; 32 oz/ac	Reduce alligatorweed for boat access.	90% control

Table 2001-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2001.

Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objective	Control Efficacy
Waccamaw River	Wat. hyacinth, wat. primrose, alligatorweed, Phragmites	2.0	\$202.98	\$101.49	Eagre	7.5 pt/ac	Reduce problem plants and Phragmites to greatest extent possible.	95% control
Lake Cherokee	Slender spikerush, naiads	20.0	\$0.00	\$0.00	Triploid grass carp	20 fish/ac (400 fish)	Reduce problem plants to enhance fishing and boating.	Too soon for
Mountain Lake	Pondweeds	5.0	\$0.00	\$0.00	Triploid grass carp	20 fish/ac (100 fish)	Reduce problem plants to enhance fishing and boating.	Too soon for
State Park Lakes								
Barnwell State Park	Waterlily	10.0	\$4,550.00	\$455.00	2, 4-D granular	200 lbs/ac	Improve fishing and boating.	85-90% control
Charles Towne Landing SP	Pennywort, alligatorweed	2.0	\$390.00	\$195.00	Rodeo	7.5 pt/ac	Provide public access for bank fishing	90-95% control
Huntington Beach State Park	Cattails, Phragmites	10.0	\$1,950.00	\$195.00	Rodeo	7.5 pt/ac	Remove cattails to improve waterfowl use; public wildlife observation, fishing.	60-65% control
Kings Mt. State Park	Slender naiad	4.0	\$1,260.00	\$315.00	Aquathol K	4 gal/ac	Reduce naiads in swimming and boating areas.	80-85% control
Little Pee Dee State Park	Watermilfoil, cowli	10.0	\$5,175.00	\$517.50	2, 4-D granular	200 lbs/ac	Reduce plants to enhance swimming, boating, and fishing.	75-80% control
Poinsett State Park	Cowli	5.0	\$2,275.00	\$455.00	2, 4-D granular	200 lbs/ac	Improve swimming, fishing and boating.	80-85% control
Santee State Park	Coontail	5.0	\$1,550.00	\$310.00	Reward	2 gal/ac	Improve fishing and boating.	85-90% control
State Park Lakes		46.0	\$17,150.00	\$372.83				
Santee Cooper Lakes		499.2	\$81,608.86	\$163.48				
GRAND TOTAL:		2774.7	\$508,074.87	\$183.11				

Table 2002-A. Summary of Expenditures by Source for Control Operations During 2002.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$92,071	\$38,877	\$0	\$53,194	CCPW/SCE&G/NWS
Black Mingo Creek	\$1,223	\$611	\$0	\$611	Georgetown County
Combahee River	\$1,279	\$640	\$0	\$640	Colleton County
Cooper River	\$36,414	\$18,207	\$0	\$18,207	Berkeley County
Goose Creek Reservoir	\$21,194	\$10,597	\$0	\$10,597	Charleston CPW
Lake Greenwood	\$31,556	\$15,778	\$0	\$15,778	Duke Power/ Greenwd Co.
Pee Dee River	\$10,436	\$5,218	\$0	\$5,218	Georgetown County
Santee Coastal Reserv	\$47,717	\$0	\$0	\$47,717	SCDNR-WFF Div.
Waccamaw River	\$1,249	\$625	\$0	\$625	Georgetown County
Lake Marion	\$15,444	\$5,838	\$0	\$9,606	Santee Cooper
Lake Moultrie	\$7,060	\$2,765	\$0	\$4,295	Santee Cooper
Church Branch Impoun	\$9,563	\$4,300	\$0	\$5,263	Santee Cooper
Dean Swamp Impound	\$10,852	\$4,297	\$0	\$6,555	Santee Cooper
Fountain Lake	\$348	\$104	\$0	\$243	Santee Cooper
Taw Caw Cr. Impoundm	\$5,781	\$1,734	\$0	\$4,046	Santee Cooper
Barnwell State Park	\$3,250	\$0	\$0	\$3,250	SC Parks, Rec, Tourism
Kings Mt. State Park	\$1,800	\$0	\$0	\$1,800	SC Parks, Rec, Tourism
<i>State Park Lake Total</i>	\$5,050	\$0	\$0	\$5,050	
<i>Non Santee Cooper Tot</i>	\$248,190	\$90,553	\$0	\$157,637	
<i>Santee Cooper Total</i>	\$49,047	\$19,038	\$0	\$30,009	
GRAND TOTAL	\$297,236	\$109,591	\$0	\$187,646	
		37%		63%	

Table 2002-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2002							
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent	Treatment Rate	Management Objectives
Back River Reservoir	Hydrilla	229.00	\$50,597.98	\$220.95	Komeen	16 gal/ac	Reduce problem plants to enhance public access and water quality.
	Water hyacinth	459.00	\$38,220.93	\$83.27	Reward	0.5 gal/ac	and maintain electric power generation and minimize impacts to
	Water primrose	40.00	\$3,251.60	\$81.29	Eagre	7.5 pt/ac	water intakes.
	Total	728.00	\$92,070.51	\$126.47			
Black Mingo Creek	Alligatorweed	10.00	\$1,222.80	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	Reduce problem plants to enhance public access and use.
Combahee River	Alligatorweed	7.00	\$855.96	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	Provide public access for bank
	Parrott feather, frog's bit	4.00	\$423.28	\$105.82	Reward	0.75 gal/ac	fishing
	Total	11.00	\$1,279.24	\$116.29			
Cooper River	Hydrilla	25.00	\$5,430.50	\$217.22	Komeen	16 gal/ac	Provide boat trails to main channel through hydrilla
	Water hyacinth	355.00	\$29,560.85	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth to greatest
	Water primrose	1.00	\$122.28	\$122.28	Arsenal (EUP), Eagre	24 oz/6 pt/ac	extent possible. Reduce problem plants to
	Water primrose	16.00	\$1,300.64	\$81.29	Eagre	7.5 pt/ac	enhance public access and use.
	Total	397.00	\$36,414.27	\$91.72			
Goose Creek Reservoir	Water lettuce, water hyacinth	235.00	\$19,568.45	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth & water lettuce to greatest extent possible.
	Water primrose	20.00	\$1,625.80	\$81.29	Eagre	7.5 pt/ac	Reduce water primrose for public use and flood
	Total	255.00	\$21,194.25	\$83.11			
Lake Greenwood	Hydrilla	109.50	\$27,121.81	\$247.69	Aquathol K	5 gal/ac	Eradicate hydrilla from site.
	Slender naiad	16.50	\$4,434.33	\$268.75	Aquathol K	5 gal/ac	Reduce naiad along developed shoreline.
	Total	126.00	\$31,556.14	\$250.45			
Pee Dee River							
Thoroughfare Creek	Water hyacinth	72.00	\$5,995.44	\$83.27	Reward	0.5 gal/ac	Reduce water hyacinth to greatest
Sandy Island	Water hyacinth	25.00	\$4,440.75	\$177.63	Reward	0.75 gal/ac	extent possible to enhance public
	Total	97.00	\$10,436.19	\$107.59			access.
Santee Coastal Reserve	Phragmites	299.00	\$47,717.41	\$159.59	Arsenal (EUP), Rodeo	24 oz/6 pt/ac	Reduce phragmites to enhance waterfowl habitat and public access and use.
Waccamaw River	Water hyacinth	15.00	\$1,249.05	\$83.27	Reward	0.75 gal/ac	Reduce water hyacinth to greatest extent possible and enhance public access.
Santee Cooper Lakes							
Lake Marion	American lotus, waterlily, watershield	1.00	\$174.83	\$174.83	Reward, Glyphosate	.5 gal/ac, .75 gal/ac	Reduce problem plant species in priority use areas and enhance public
	Giant cutgrass	50.50	\$7,255.61	\$143.68	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	access and use, enhance waterfowl habitat, and maintain electric
	Lyngbya, Pithophora	18.00	\$2,541.55	\$141.20	K-Tea, Reward	6.0 gal/ac, 2.0 gal/ac	power generation.
	Water hyacinth	14.50	\$1,364.90	\$94.13	Reward	.5 gal/ac	
	Water primrose, Alligatorweed,	29.00	\$4,014.22	\$138.42	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Water pod, water willow, Slender naiad, pondweed	0.25	\$92.55	\$370.20	Reward, Komeen	2.0 gal/ac, 4.0 gal/ac	
	Total	113.25	\$15,443.66	\$136.37			
Lake Moultrie	American lotus, waterlily, watershield	36.50	\$3,688.61	\$101.06	Glyphosate	.75 gal/ac.	Reduce problem plant species in priority use areas and enhance public
	Bladderwort, pondweed	1.25	\$357.04	\$285.63	Reward	2 gal/ac	access and use, enhance waterfowl habitat, and maintain electric
	Hydrilla	0.50	\$162.51	\$325.02	Komeen / Reward	4.0 / 2.0 gal/ac	power generation.
	Water primrose, Alligatorweed	11.25	\$1,606.54	\$142.80	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Giant cutgrass, cattail	11.25	\$1,245.20	\$110.68	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Total	60.75	\$7,059.90	\$116.21			

Table 2002-B. Summary of S.C. Aquatic Plant Management Program Control Operations and Expenditures During 2002						Treatment Rate	Management Objectives
Waterbody	Target Plants	Acres Treated	Total Cost	Cost/Acre	Control Agent		
Church Branch Impoundment	Water primrose, Alligatorweed	2.50	\$317.35	\$126.94	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	Reduce problem plant species to enhance public access and use and
	Giant cutgrass, cattail	1.00	\$126.94	\$126.94	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	to enhance waterfowl habitat.
	Lyngbya, Pithophora	2.00	\$251.91	\$125.96	K-Tea, Reward, Hydrothol 191 Granular & Liquid	6 gal/ac, 2 gal/ac, .5 gal/ac & 100 lbs/ac	
	Water milfoil, parrot feather	7.75	\$3,037.74	\$391.97	2,4-D Granular	150 - 200 lbs/ac	
	Coontail	1.25	\$629.67	\$503.74	Reward	2.0 gal/ac	
	Pondweed	16.00	\$4,888.83	\$305.55	Aquathol K Liquid	6.0 gal/ac	
	Slender naiad	1.00	\$310.43	\$310.43	Aquathol K Liquid	6.0 gal/ac	
	Total	31.50	\$9,562.87	\$303.58			
Dean Swamp	Hydrilla	26.50	\$7,657.66	\$288.97	Aquathol K, Hydrothol 191 Liquid, Reward, Komeen	6.0 gal/ac, .50 gal/ac, 2.0 gal/ac, 4.0 gal/ac	Reduce problem plant population to improve recreational access
	Coontail	2.00	\$581.91	\$290.96	Aquathol K	5 gal/ac	
	Water primrose, Alligatorweed	3.00	\$281.28	\$93.76	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Lyngbya, Pithophora	12.00	\$2,331.21	\$194.27	Hydrothol 191 Liquid / Granular, Reward, K-Tea	.5 - 1.0 gal / 60-80 lb/ac, 2.0 gal/ac, 6.0 gal/ac	
	Total	43.50	\$10,852.06	\$249.47			
Fountain Lake	Water primrose, Alligatorweed	2.00	\$173.76	\$86.88	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	Reduce problem plant population to improve recreational access
	American lotus, fragrant waterlily, watershield	2.00	\$173.76	\$86.88	Glyphosate	.75 gal/ac	
	Total	4.00	\$347.52	\$86.88			
Taw Caw Impoundment	Coontail	10.00	\$2,590.95	\$259.10	Aquathol K	5 gal/ac	Reduce problem plant population to improve recreational access
	Bladderwort, slender naiad	2.00	\$518.20	\$259.10	Aquathol K	5 gal/ac	
	Giant cutgrass, cattail	2.00	\$241.48	\$120.74	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Water primrose, Alligatorweed,	20.00	\$2,429.95	\$121.50	Arsenal (EUP), Glyphosate	.125 - .375 gal/ac, 50 - .75 gal/ac	
	Total	34.00	\$5,780.58	\$170.02			
Barnwell State Park - Swimming Lake	Waterlily	10.00	\$3,250.00	\$325.00	2,4-D granular	200 lb/ac	Reduce problem plant population to improve recreational access
King's Mt. State Park - Lake Crawford	Slender naiad	4.00	\$1,800.00	\$450.00	Aquathol K	4.0 gal/ac	Reduce problem plant population to improve recreational access
	Total	14.00	\$5,050.00	\$360.71			
SCDNR Total		1938.00	\$243,139.86	\$125.46			
Santee Cooper Total		287.00	\$49,046.59	\$170.89			
State Park Lakes Total		14.00	\$5,050.00	\$360.71			
Grand Total		2239.00	\$297,236.45	\$132.75			

Table 2003-A. Summary of Expenditures by Source for Control Operations During 2003.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$69,929	\$27,971	\$0	\$41,957	SCE&G, CCPW
Black Mingo Creek	\$2,144	\$858	\$0	\$1,286	Georgetown Co.
Black River	\$476	\$191	\$0	\$286	Georgetown Co.
Cooper River	\$46,906	\$18,762	\$0	\$28,144	Berkeley Co., SCE&G
Goose Creek Reservoir	\$19,085	\$7,634	\$0	\$11,451	Charleston CPW
Lake Greenwood	\$6,890	\$2,756	\$0	\$4,134	Greenwood Co.
Lake Murray	\$369,529	\$147,811	\$0	\$221,717	SCE&G, Lexington Co., Richland Co.
Pee Dee River	\$772	\$386	\$0	\$386	Georgetown Co.
Santee Coastal Reserve	\$25,128	\$0	\$0	\$25,128	Santee Coastal Reserve
Waccamaw River	\$515	\$257	\$0	\$257	Horry Co.
Lake Marion	\$10,701	\$4,281	\$0	\$6,421	Santee Cooper
Lake Moultrie	\$14,272	\$5,709	\$0	\$8,563	Santee Cooper
Taw Caw Impoundment	\$26,808	\$10,723	\$0	\$16,085	Santee Cooper
Potato Creek Imp.	\$14,620	\$5,848	\$0	\$8,772	Santee Cooper
Dean Swamp	\$22,313	\$8,925	\$0	\$13,388	Santee Cooper
Fountain Lake	\$1,264	\$506	\$0	\$758	Santee Cooper
Church Branch Imp.	\$1,693	\$677	\$0	\$1,016	Santee Cooper
<i>State Park Lake Total</i>	\$0	\$0	\$0	\$0	
<i>Non Santee Cooper Total</i>	\$541,374	\$206,626	\$0	\$334,747	
<i>Santee Cooper Total</i>	\$91,671	\$36,669	\$0	\$55,003	
	\$633,045	\$243,295	\$0	\$389,750	

Table 2003-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2003								
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objectives	
Back River Reservoir	Hydrilla	131.25	\$29,354.06	\$223.65	Komeen	16 gal/ac	Reduce problem plants to enhance p water quality, and maintain electric po and minimize impacts to water intake	
	Water hyacinth	153.00	\$13,122.81	\$85.77	Reward	0.5 gal/ac		
	Water hyacinth	2.00	\$238.24	\$119.12	Renovate	0.75 gal/ac		
	Water hyacinth/primrose	221.00	\$25,155.12	\$113.82	Renovate	0.5 - 0.75 gal/ac		
	Water hyacinth/primrose	24.00	\$2,058.48	\$85.77	Reward	0.5 gal/ac		
TOTAL:		531.25	\$69,928.71	\$131.63				
Black Mingo Creek	Alligatorweed	18.00	\$2,144.16	\$119.12	Renovate 3	0.75 gal/ac	Reduce problem plants to enhance p and water quality.	
TOTAL:		18.00	\$2,144.16	\$119.12				
Black River	Alligatorweed	4.00	\$476.48	\$119.12	Renovate 3	0.75 gal/ac	Reduce problem plants to enhance p and water quality.	
TOTAL:		4.00	\$476.48	\$119.12				
Cooper River	Hydrilla	37.50	\$8,386.88	\$223.65	Komeen	16 gal/ac	Provide boat trails to main channel th Reduce problem plants to enhance p use.	
	Water hyacinth	99.00	\$8,491.23	\$85.77	Reward	0.5 gal/ac		
	Water hyacinth/primrose	224.00	\$26,682.88	\$119.12	Renovate	0.75 gal/ac		
	Water hyacinth/primrose	39.00	\$3,345.03	\$85.77	Reward	0.5 gal/ac		
		399.50	\$46,906.02	\$117.41				
Goose Creek Reservoir	Water hyacinth/primrose	16.00	\$1,905.92	\$119.12	Renovate	0.75 gal/ac	Reduce water hyacinth & water lettuc extent possible.	
	Water hyacinth/Water lettuce	34.00	\$3,677.68	\$108.17	Renovate	0.5 - 0.75 gal/ac		
	Water hyacinth/Water lettuce	156.00	\$13,501.62	\$86.55	Reward	0.5 gal/ac		
	TOTAL:	206.00	\$19,085.22	\$92.65				
Lake Greenwood	Hydrilla	25.00	\$6,889.50	\$275.58	Aquathol-k	5 gal/ac	Eradicate hydrilla from site.	
TOTAL:		25.00	\$6,889.50	\$275.58				
Lake Murray	Hydrilla	4300.00	\$369,528.60	\$85.94	Sterile Grass Carp	15 per vegetated acre	Reduce hydrilla to minimize spread a public access and use.	
TOTAL:		4300.00	\$369,528.60	\$85.94				
Pee Dee River	Water Hyacinth	9.00	\$771.93	\$85.77	Reward	0.5gal/ac	Reduce hyacinth to minimize spread public access and use.	
TOTAL:		9.00	\$771.93	\$85.77				
Santee Coastal Reserve	Phragmites	156.00	\$25,128.48	\$161.08	Arsenal/Rodeo	24 oz/6 pints	Reduce phragmites to enhance water public access and use.	
TOTAL:		156.00	\$25,128.48	\$161.08				
Waccamaw River	Water hyacinth	6.00	\$514.62	\$85.77	Reward	0.5gal/ac	Reduce hyacinth to minimize spread public access and use.	
TOTAL:		6.00	\$514.62	\$85.77				
Santee Cooper Lakes								
Lake Marion	Lyngbya, Pithophora	8.00	\$1,142.79	\$142.85	Hydrothol 191 Liquid / Granular,	0.5 - 1.0 gal / 60-80 lb/ac, 2.0	Reduce problem plant populations to to public access, recreational use, irri withdrawals, navigation, and water qu	
	Water hyacinth	22.00	\$2,381.46	\$108.25	Reward / Renovate	0.5 gal/ac		
	Water primrose, Alligatorweed, Water pod, Water willow	56.50	\$7,177.0	\$127.03	Arsenal EUP, Arsenal EUP/Glyphosate, Glyphosate	0.25 - 0.375 gal/ac, 0.125 - 0.25 / 0.5 gal/ac, 0.75 gal/ac		
TOTAL:		86.50	\$10,701.25	\$123.71				
Lake Moultrie	American lotus, Water lily, Water shield	30.00	\$2,684.20	\$89.47	Glyphosate	0.75 gal/ac.	Reduce problem plant populations to to public access, recreational use, irri withdrawals, navigation, and water qu	
	Bladderwort, Pondweed	0.60	\$131.41	\$219.02	Reward	2 gal/ac		
	Cabomba, Watermilfoil	4.00	\$970.71	\$242.68	Avast SRP	10 lbs/ac		
	Hydrilla	0.20	\$116.87	\$584.35	Komeen / Reward	4.0 / 2.0 gal/ac		
	Water primrose, Alligatorweed	76.00	\$8,996.64	\$118.38	Arsenal EUP, Arsenal EUP/Glyphosate, Glyphosate	0.25 - 0.375 gal/ac, 0.125 - 0.25 / 0.5 gal/ac, 0.75 gal/ac		
	Giant cutgrass, Cattail	11.00	\$1,372.52	\$124.77	Arsenal EUP, Arsenal EUP/Glyphosate, Glyphosate	0.25 - 0.375 gal/ac, 0.125 - 0.25 / 0.5 gal/ac, 0.75 gal/ac		
	TOTAL:	121.80	\$14,272.35	\$117.18				

Table 2004-A. Summary of Expenditures by Source for Control Operations During 2004.

Water Body Name	Total Cost	Federal	State	Local	Local Sponsor
Back River Reservoir	\$94,772	\$47,386	\$23,693	\$23,693	SCE&G, CCPW
Black Mingo Creek	\$2,523	\$1,262	\$630	\$631	Georgetown Co.
Black River	\$2,523	\$1,262	\$630	\$631	Georgetown Co.
Bonneau Ferry	\$10,736	\$0	\$10,736	\$0	SCDNR
Cooper River	\$62,011	\$31,006	\$15,502	\$15,503	Berkeley Co., SCE&G
Delta Plantation	\$2,158	\$0	\$2,158	\$0	SCDNR
Edisto River	\$1,733	\$0	\$520	\$1,213	SCDNR, USF&W
Goose Creek Reservoir	\$19,066	\$9,533	\$4,766	\$4,767	Charleston CPW
Lake Greenwood	\$10,711	\$5,356	\$2,677	\$2,678	Greenwood Co.
Lake Murray	\$1,364	\$682	\$341	\$341	SCE&G, Lexington Co., Richland Co.
Little Pee Dee River	\$7,131	\$3,566	\$1,783	\$1,783	Horry Co.
Lumber River	\$803	\$401	\$201	\$201	Horry Co.
Pee Dee River	\$4,206	\$2,103	\$1,052	\$1,051	Georgetown Co.
Santee Coastal Reserve	\$114,517	\$0	\$34,355	\$80,162	Santee Coastal Reserve
Yawkee Wildlife Center	\$43,294	\$0	\$12,988	\$30,306	Yawkee Wildlife Center
Lake Marion	\$24,531	\$12,265	\$6,133	\$6,133	Santee Cooper
Lake Moultrie	\$9,167	\$4,583	\$2,292	\$2,292	Santee Cooper
Taw Caw Impoundment	\$3,750	\$1,875	\$937	\$938	Santee Cooper
Potato Creek Imp.	\$12,692	\$6,346	\$3,173	\$3,173	Santee Cooper
Dean Swamp	\$20,883	\$10,441	\$5,221	\$5,221	Santee Cooper
Fountain Lake	\$819	\$409	\$205	\$205	Santee Cooper
Church Branch Imp.	\$9,425	\$4,712	\$2,356	\$2,357	Santee Cooper
Charlestown Landing SP	\$1,815	\$0	\$0	\$1,815	SCPRT
Kings Mt. SP Lk. Crawford	\$3,325	\$0	\$0	\$3,325	SCPRT
Sesquicentennial SP	\$6,860	\$0	\$0	\$6,860	SCPRT
<i>SCDNR Total</i>	\$377,548	\$102,555	\$112,034	\$162,958	
<i>State Park Lake Total</i>	\$12,000	\$0	\$0	\$12,000	
<i>Santee Cooper Total</i>	\$81,266	\$40,633	\$20,317	\$20,316	
<i>Grand Total</i>	\$470,814	\$143,188	\$132,348	\$195,276	

Table 2004-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2004								
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objectives	
Back River Reservoir	Hydrilla	167.25	\$ 38,119.62	\$ 227.92	Komeen	16 gal/ac	Reduce problem plants to enhance public water quality, and maintain electric power minimize impacts to water intakes.	
	Hydrilla	25.00	\$ 16,281.75	\$ 651.27	Aquathol Super K	40 lbs/ac		
	Water hyacinth	228.00	\$ 19,927.20	\$ 87.40	Reward	0.5 gal/ac		
	Water hyacinth	90.00	\$ 10,707.40	\$ 118.97	Renovate	0.5 - 0.75 gal/ac		
	Cabomba	4.00	\$ 1,282.56	\$ 320.64	Hydrothol 191 Liquid	7 gal/ac		
	Water primrose	75.00	\$ 8,453.10	\$ 112.71	Renovate	0.5 - 0.75 gal/ac		
TOTAL:		589.25	\$ 94,771.63	\$ 160.83				
Black Mingo Creek	Alligatorweed	20.00	\$ 2,523.00	\$ 126.15	Habitat/Glypro	0.250 gal/ac/.750 gal/ac	Reduce problem plants to enhance public water quality.	
TOTAL:		20.00	\$ 2,523.00	\$ 126.15				
Black River	Alligatorweed	20.00	\$ 2,523.00	\$ 126.15	Habitat/Glypro	0.250 gal/ac/.750 gal/ac	Reduce problem plants to enhance public water quality.	
TOTAL:		20.00	\$ 2,523.00	\$ 126.15				
Cooper River	Hydrilla	60.25	\$ 13,732.18	\$ 227.92	Komeen	16 gal/ac	Provide boat trails to main channel through problem plants to enhance public access and use.	
	Water hyacinth	193.00	\$ 16,868.20	\$ 87.40	Reward	0.5 gal/ac		
	Water hyacinth	174.00	\$ 21,120.12	\$ 121.38	Renovate	0.75 gal/ac		
	Water hyacinth	66.00	\$ 9,413.58	\$ 142.63	Habitat/Glypro	0.250 gal/ac/.750 gal/ac		
	Water primrose	8.00	\$ 877.36	\$ 109.67	Habitat	0.250 gal/ac		
TOTAL:		501.25	\$ 62,011.44	\$ 123.71				
Goose Creek Reservoir	Water hyacinth	51.00	\$ 4,457.40	\$ 87.40	Reward	0.5 gal/ac	Reduce water hyacinth & water lettuce to possible.	
	Water hyacinth	28.00	\$ 3,398.64	\$ 121.38	Renovate	0.5 -0.75 gal/ac		
	Water lettuce	125.00	\$ 10,925.00	\$ 87.40	Reward	0.5 gal/ac		
	Cutgrass/Water primrose	2.00	\$ 285.26	\$ 142.63	Habitat/Glypro	0.250 gal/ac/.750 gal/ac		
TOTAL:		206.00	\$ 19,066.30	\$ 92.55				
Edisto River	Phragmites	12.00	\$ 1,733.52	\$ 144.46	Habitat	0.375 gal/ac		
TOTAL:		12.00	\$ 1,733.52	\$ 144.46				
Lake Greenwood	Hydrilla	25.00	\$ 7,020.75	\$ 280.83	Aquathol-k	5 gal/ac	Eradicate hydrilla from site.	
	Naiad	20.00	\$ 3,690.60	\$ 184.53	Aquathol-k		Reduce problem plants to enhance public water quality.	
TOTAL:		45.00	\$ 10,711.35	\$ 238.03		3 gal/ac		
Lake Murray	Hydrilla	5.00	\$ 1,363.80	\$ 272.76	Nautique	12 gal/ac	Reduce hydrilla to minimize spread and improve access and use.	
TOTAL:		5.00	\$ 1,363.80	\$ 272.76				
Lumber River	Alligatorweed	6.00	\$ 802.86	\$ 133.81	Habitat/Eagre	.250 gal/ac/.500 gal/ac	Reduce problem plants to enhance public water quality.	
		50.00	\$ 7,131.50	\$ 142.63	Habitat/Glypro		Reduce problem plants to enhance public water quality.	
TOTAL:		56.00	\$ 7,934.36	\$ 141.69		.250 gal/ac/.500 gal/ac		
Bonneau Ferry	Water Primrose, Water hyacinth,	66.00	\$ 10,735.60	\$ 162.66	Habitat/Glypro	0.250 - 0.375 gal/ac/0.750 gal/ac	Reduce phragmites to enhance waterfowl access and use.	
Misc Ponds & Reserves	Frog's bit, Lotus, Cutgrass, Cattails							
TOTAL:		66.00	\$ 10,735.60	\$ 162.66				
Delta Plantation	Salvinia Molesta	4.00	\$ 538.84	\$ 134.71	Reward	1 gal/ac	Eradicate Salvinia from site.	
	Salvinia Molesta	2.00	\$ 1,618.86	\$ 809.43	Sonar	0.500 gal/ac		
TOTAL:		6.00	\$ 2,157.70	\$ 359.62				
Pee Dee River	Water Hyacinth	40.00	\$ 3,496.00	\$ 87.40	Reward	0.5gal/ac	Reduce hyacinth to minimize spread and improve access and use.	
Sandy Island	Phragmites	4.00	\$ 709.68	\$ 177.42	Habitat/Glypro	.375 gal/ac/.750gal/ac	Reduce phragmites to enhance public access and use.	
TOTAL:		44.00	\$ 4,205.68	\$ 95.58				
Santee Coastal Reserve	Phragmites	494.00	\$ 114,516.98	\$ 231.82	Habitat/Glypro	.375 gal/ac/.750gal/ac	Reduce phragmites to enhance waterfowl access and use.	
TOTAL:		494.00	\$ 114,516.98	\$ 231.82				
Tom Yawkey	Phragmites	200.00	\$ 43,294.00	\$ 216.47	Habitat/Glypro	.375 gal/ac/.750gal/ac	Reduce phragmites to enhance waterfowl access and use.	
TOTAL:		200.00	\$ 43,294.00	\$ 216.47				
Santee Cooper Lakes								
Lake Marion	American Lotus, Waterlily, Water Shield	14.00	\$ 1,575.66	\$ 112.55	Reward, Glyphosate	.5 gal/ac, .75 gal/ac	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.	
	Cabomba, Variable Leaf Water Milfoil, Parrots Feather	0.50	\$ 60.49	\$ 120.98	Sonar, Renovate	40 lbs/ac, .5 gal/ac		
	Giant Cutgrass, Arundo Donax	51.50	\$ 5,884.02	\$ 114.25	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/ac, .125 - .25 / .50 gal/ac, .75 gal/ac		
	Lyngbya, Pithophora	13.00	\$ 1,507.99	\$ 116.00	Hydrothol 191 Liquid / Granular, Cutrine Plus Granular, K-Tea	.5 - 1.0 gal / 60-80 lb/ac, 60 lbs/ac, 2.0 - 6.0 gal/ac		
	Water Hyacinth	110.50	\$ 10,654.73	\$ 96.42	Reward, Renovate	.5 gal/ac, .5 gal/ac		
	Water Primrose, Alligatorweed, Water Pod, Water Willow	36.50	\$ 4,847.98	\$ 132.82	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.50 gal/ac, .125 - .25 / .50 gal/ac, .75 gal/ac, .50 gal/ac		
TOTAL:		226.00	\$ 24,530.87	\$ 108.54				

Table 2004-B Summary of S.C. Aquatic Plant Management Control Operations and Expenditures During 2004							
Water Body	Target Plants	Acres	Total Cost	Cost/Acre	Control Agent	Rate	Management Objectives
Lake Moultrie	American Lotus, Waterlily, Water Shield	28.80	\$ 2,934.25	\$ 101.88	Reward, Glyphosate	.5 gal/acre, .75 gal/acre	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.
	Bladderwort, Pondweed, Slender Naiad	1.50	\$ 273.63	\$ 182.42	Reward, Aquathol K Liquid, Aquathol Super K	2.0 gal/acre, 5.0 gal/acre, 40 lb/acre	
	Cabomba, Watermilfoil	2.50	\$ 692.30	\$ 276.92	Sonar	40 lbs/acre	
	Water Primrose, Alligatorweed	42.30	\$ 3,801.89	\$ 89.88	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.50 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre, .50 gal/acre	
	Water Hyacinth	7.00	\$ 713.62	\$ 101.95	Renovate, Reward	.50 gal/acre	
	Giant Cutgrass, Cattail, Arundo Donax	9.00	\$ 750.87	\$ 83.43	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.50 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre, .50 gal/acre	Reduce problem plants to enhance waterfowl access and use.
TOTAL:		91.10	\$ 9,166.56	\$ 100.62			
Taw Caw Impoundment	Coontail	4.00	\$ 1,240.12	\$ 310.03	Aquathol K Liquid	5 gal/acre	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.
	Hydrilla	6.00	\$ 1,860.16	\$ 310.03	Aquathol K Liquid, Sonar	5 - 10 gal/acre, 10 lbs/acre	
	Water Primrose, Alligatorweed,	7.00	\$ 650.09	\$ 92.87	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre	
TOTAL:		17.00	\$ 3,750.37	\$ 220.61			
Potato Creek Impoundment *SCDNR Waterfowl Management Area.	Hydrilla	36.50	\$ 12,692.12	\$ 347.73	Aquathol K Liquid, Sonar	5 - 10 gal/acre, 10 lbs/acre	Reduce problem plant populations to provide public access to open water and prevent the areas.
TOTAL:		36.50	\$ 12,692.12	\$ 347.73			
Dean Swamp	Hydrilla	52.00	\$ 16,152.85	\$ 310.63	Aquathol K Liquid, Sonar	5 - 10 gal/acre, 10 lbs/acre	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.
	Water Primrose, Alligatorweed	14.00	\$ 1,534.79	\$ 109.63	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre	
	Cabomba	3.00	\$ 1,030.88	\$ 343.63	Sonar	40 lbs/acre	
	Lyngbya, Pithophora	18.00	\$ 2,164.05	\$ 120.23	Hydrothol 191 Liquid / Granular, Cutrine Plus Granular, K-Tea	.5 - 1.0 gal / 60-80 lb/acre, 60 lbs/acre, 2.0 - 6.0 gal/acre	
TOTAL:		87.00	\$ 20,882.57	\$ 240.03			
Fountain Lake	Water primrose, Alligatorweed	5.00	\$ 819.15	\$ 163.83	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.
TOTAL:		5.00	\$ 819.15	\$ 163.83			
Church Branch Impoundment	Water Primrose, Alligatorweed	3.00	\$ 516.92	\$ 172.31	Habitat, Habitat/Glyphosate, Glyphosate, Renovate	.25 - .375 gal/acre, .125 - .25 / .50 gal/acre, .75 gal/acre	Reduce problem plant populations to reduce public access, recreational use, irrigation navigation, and water quality.
	Lyngbya, Pithophora	0.75	\$ 107.76	\$ 143.68	K-Tea, Reward, Hydrothol 191 Granular & Liquid	6 gal/acre, 2 gal/acre, .5 gal/acre & 100 lbs/acre	
	Water Milfoil, Parrot Feather	2.50	\$ 1,276.79	\$ 510.72	2,4-D Granular	150 - 200 lbs/acre	
	Pondweed	30.25	\$ 7,523.08	\$ 248.70	Reward, Aquathol K Liquid, Aquathol Super K	2.0 gal/acre, 5.0 gal/acre, 40 lb/acre	Reduce problem plants to enhance waterfowl access and use.
TOTAL:		36.50	\$ 9,424.55	\$ 258.21			
State Park Lakes							
Charles Towne Landing SP	Duck weed	5.00			Fluridone	1 pint/acre	Reduce problem plants to enhance public access and use.
	alligator weed & penny wort	3.00	\$ 1,815.00	\$ 226.88	Glyphosate	7.5 pints/acre	
TOTAL:		8.00	\$ 1,815.00	\$ 226.88			
Kings Mountain SP	Slender naiad	7.00	\$ 3,325.00	\$ 475.00	Aquathol K	4 gallons/acre	Reduce problem plants to enhance public access and use.
TOTAL:		7.00	\$ 3,325.00	\$ 475.00			
Sesquicentennial:	Waterlily, watershield	8.50	\$ 6,860.00	\$ 807.06	2,4 D-Bee granular	200 lbs./acre	Reduce problem plants to enhance public access and use.
TOTAL:		8.50	\$ 6,860.00	\$ 807.06			
SCDNR TOTAL		2264.50	\$ 377,548.36	\$ 166.72			
SANTEE COOPER TOTAL		499.10	\$ 81,266.19	\$ 162.83			
STATE PARKS TOTAL		23.50	\$ 12,000.00	\$ 510.64			
GRAND TOTAL		2787.10	\$ 470,814.55	\$ 168.93			

APPENDIX G

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2005 South Carolina Aquatic Plant Management Plan

Summary of Public Comments, Responses, and Plan Modifications to the Draft 2005 South Carolina Aquatic Plant Management Plan

Commenters: Lee Bacot, Teresa Cannon, Jeremiah Jensen, Alan Rae, David Rogers, Randy Saliga, Michael Sizer, Joseph M. Walker, Mark West, Jesse N. Williams III, Jon & Judy Willkomm, Sharpep2

Lake Murray:

Comments:

I support the management plan at the level APMC has recommended for 2005. (Saliga)

I'd voice my opinion against the use of more grass carp... I have no problem with the spot treatment of access points and intakes, but I'm worried that the use of more carp could result in a situation similar to Santee where the grass was totally exterminated. (Jensen)

Why can't we just come to an agreement on the hydrilla (Lake Murray) like they did on Lake Guntersville, AL? (Rae)

Replacing vegetation removed by carp with artificial habitat would be a great compromise for fishermen. (Rogers)

The reason the fishing is good is because of the grass! Take a note from Va. And Maryland they treat it as a natural resource up there, they even have signs at the landings asking people to protect it! (Walker)

Introducing the grass carp to Lake Murray is killing the grass off too fast, before long there is going to be no grass left, Murray is a recreational lake and fishing is going to suffer. (West)

The idea of releasing large numbers of grass carp is frightening. (Williams)

I'm afraid to purchase a pontoon because of the weeds. (Cannon)

Primrose is blocking access and navigation for many residents. (Sizer)

We are very concerned about water primrose and hope that serious steps are being taken. (Willkomm)

I am anxious about the continual uncontrolled spread of primrose in the upper part of the lake. I urge the DNR to recognize the rapidly expanding growth of water primrose as a major threat to Lake Murray and to include the control of this plant in the 2005 plan. (Bacot)

It comes as no surprise to any of us that there is no plan to address the primrose problem and that DNR fails to even mention it. We are not in the more affluent section of the lake. (Sharpep2)

Response:

Aquatic vegetation in general is beneficial to the lake ecology and the plan clearly acknowledges this point by specifying as one of the management objectives (2.c.) to maintain diverse aquatic plant community. Along those lines, the DNR hopes to reinvigorate the Lake Murray Habitat Enhancement Program that it initiated several years ago to plant desirable native vegetation to enhance fish and wildlife habitat and help control shoreline erosion. Also, one of the main reasons for stocking while the lake was down is to be able to achieve control using fewer grass carp, thus minimizing the possibility of controlling too much of the vegetation.

This year's plan is consistent with the 2004 plan. The 2005 plan calls for no stocking of grass carp on Lake Murray unless hydrilla coverage **exceeds 4,300 acres above the 330-foot contour at which time the Aquatic Plant Management Council may reconsider the need for additional grass carp.** A late fall survey showed only 2,400 acres of hydrilla, a dramatic increase in that acreage would have to occur to consider stocking more carp. However, this year's plan does include the option of select herbicide control around municipal water intakes and high traffic landings if needed.

Water primrose is normally a shoreline species. It extends out into the water but is rooted close to the shoreline. During the two-year drawdown water primrose established its self at various locations throughout the upper part of Lake Murray. However, as water levels rise and the lake returns to its normal elevation, the water primrose problem is expected to subside. SCE&G and DNR will monitor the growth and extent of the primrose throughout 2005 and reconsider control options as needed.

Plan Modifications:

A long-term management goal is added in Section 12-f.

Section 12-f states: Water primrose - Water primrose, a shoreline plant, became problematic in the upper portion of the lake last year. The two-year drawdown exposed a lot of unvegetated shoreline where water primrose quickly spread and re-established at the 345-348 foot contour level. While this plant can be invasive and cause localized problems, it has been in the lake for decades and is typically not a threat to general public access and use of the waterway. Based on past experience, it is expected that most of the plants that are rooted in deep water will not survive after the lake level returns to full pool. Therefore, there are no plans to control its growth this year. However, the SCDNR and SCE&G will monitor water primrose growth and consider control options if impacts are greater than anticipated.

Santee Cooper Lakes:**Comments:**

What's this stuff I read on 2004 Santee Cooper about allowing fish to have 10% surface vegetation area for fish? What sense does that make? (Rae)

I implore you to not stock more grass carp in our impoundments. There are so many other methods, some are which expensive and you have listed in the management plan. Our natural

resources, which include our fish and wildlife, need to be cared for with all parties in mind, not just hunters and fishermen, and not just wealthy property owners that ski and pleasure boat. (Williams)

One suggestion I have is that before we release more grass carp into any impoundments, let's consult **B.A.S.S.** or other organizations that have the funding and database to do the research. (Williams)

Response:

The language in the draft plan is consistent with the comments not to stock more grass carp in the Santee Cooper Lakes. No additional grass carp are planned for 2005, but the Council may reconsider the need for additional fish if hydrilla regrowth and regrowth potential warrants it.

The long-term management strategy for hydrilla control in the Santee Cooper Lakes is to maintain a sufficient number of grass carp in the system to keep hydrilla suppressed while allowing desirable native vegetation to flourish. The DNR and Santee Cooper recognize that although the grass carp have been effective in controlling hydrilla they have also controlled many desirable submersed aquatic plant species. In response to this concern, the agencies have signed an agreement that identifies management goals and objectives that try to maintain 10% of the lakes' surface area as beneficial vegetated habitat for fish, waterfowl and other aquatic organisms. The Aquatic Plant Management Council has adopted the management agreement as part of the long-term management strategy for the Santee Cooper Lakes and has included it in the final 2005 Aquatic Plant Management Plan. An important part of the agreement between the agencies is accurate and timely monitoring of aquatic vegetation. The agencies will work together in developing a monitoring work plan. Decisions regarding subsequent stocking of grass carp will be determined by the Council following assessment of monitoring results by DNR, Santee Cooper, and other agency representatives on the Council.

Submersed and emergent vegetation provides important habitat for waterfowl and fish as well as other types of wildlife. Management plans in public waters always attempt to control invasive species while trying to maintain desirable vegetation. Grass carp are used only after other more selective control methods have proven ineffective and after ample discussion in public meetings and plan reviews. Except for two sub-impoundments of Lake Marion, no grass carp are planned for any state waterways in 2005.

Plan Modifications:

None at present.

25 copies of this document were printed at a total cost of \$226. The individual cost per copy was \$9.04.



DNR

The South Carolina Department of Natural Resources prohibits discrimination on the basis of race, color, national origin, disability, age, sex, or religion. Direct all inquiries to the Office of Human Resources,
P.O. Box 167, Columbia, SC 29202.